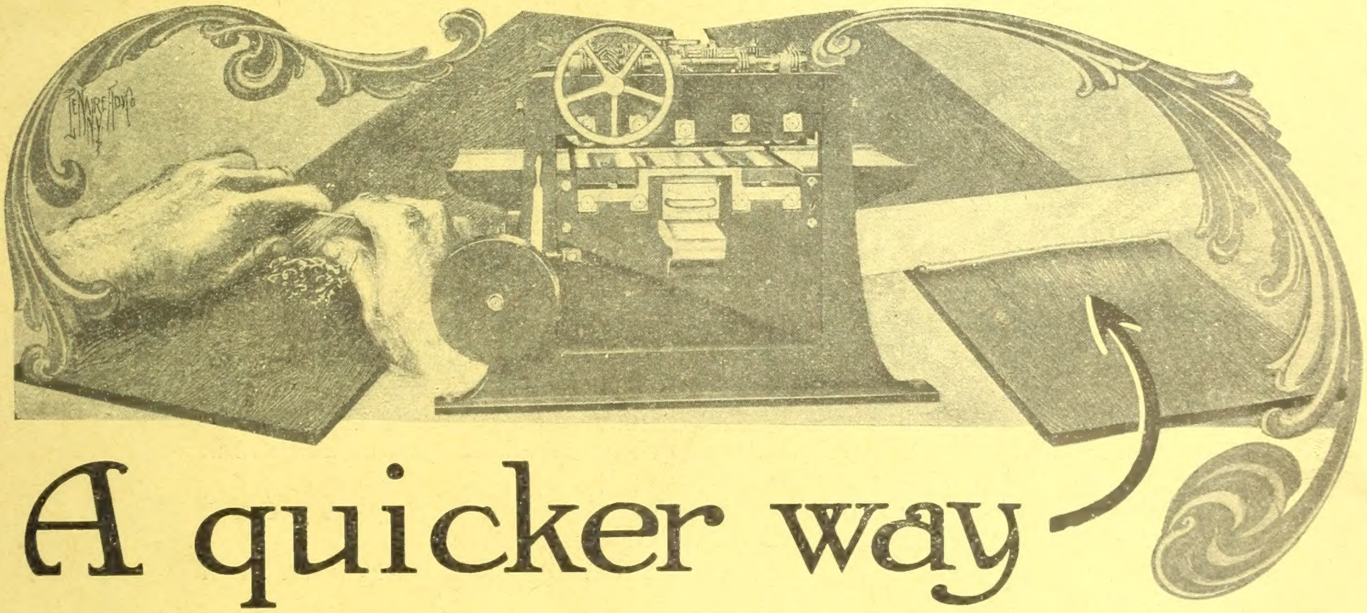
Digitized by the Internet Archive
in 2014

https://archive.org/details/canadianwood14

Volume Fourteen TORONTO, JANUARY, 1914 Number One

Canadian Woodworker



To get the final finish on your flat hardwood surfaces, solid or veneered.

Whitney Scrapers

take off a thin shaving and leave the surface absolutely smooth—so smooth, in fact, that little or no handwork is necessary to bring the work to perfection of finish.

Spots are never scored out by Whitney Scrapers, nor are the pores of the wood filled with the grit and dust coincident with sanding.

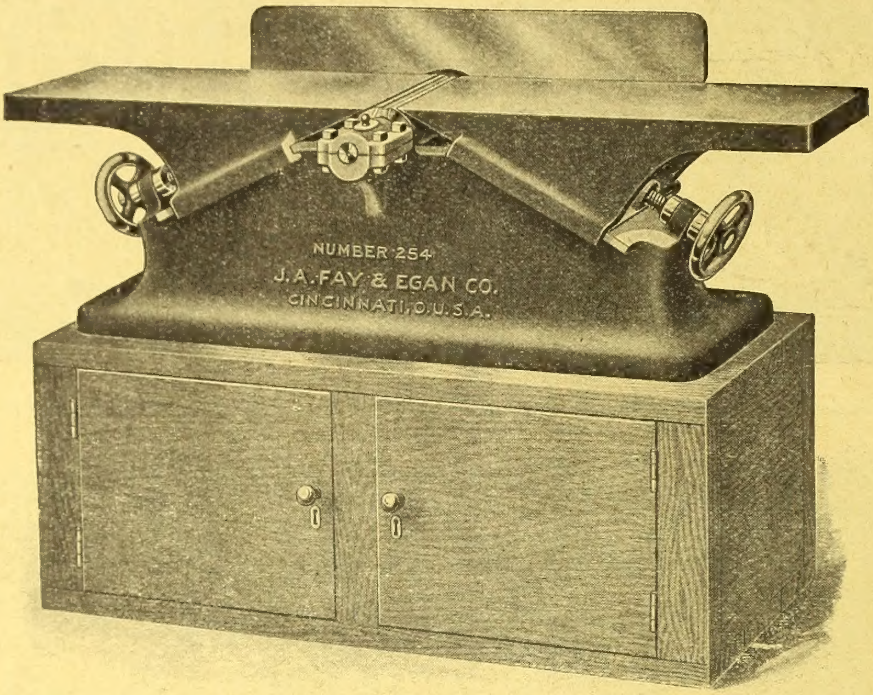
A word to us will bring you samples of hardwoods finished on a Whitney Wood Scraping Machine, cost records and other descriptive matter—enough positive facts to decide you in favor of Whitney Scraper economy in your business. Say the word now.

Baxter D. Whitney & Son, Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives; Henry Kelly & Co.
26 Pall Mall, Manchester, England.

Alphabetical List of Advertisers, page 12


NUMBER 254
J. A. FAY & EGAN CO.
CINCINNATI, O. U. S. A.

Every Workshop Needs Me—

In a small shop I will take care of all planing, jointing, rabbetting, etc.

In a large shop I will start quicker and do the small jobs just as well and at less cost than my bigger brothers.

If several like me are placed at different points in a large shop we will save many a step and greatly increase output.

I am so handy that the hand plane is practically eliminated wherever I am used.

I can be placed on a bench, a cabinet, or on an iron pedestal.

I take up small floor space.

I consume hardly any power in operation.

I am quickly adjusted for different kinds of work.

I have tables with lips of steel, mounted on inclines.

I can not cut off any fingers as I am fitted with a patented circular safety cutterhead.

I will turn out perfectly smooth work because my safety head is round, runs true and is fitted with thin, air-hardened "Tungsten" steel knives which require sharpening only once a week if jointing attachment is properly used.

I have made money for every woodshop in which I am used.

I am sold at a price within the reach of any shop owner and quickly pay my own way.

I AM THE "FAY-EGAN LIGHTNING" No. 254 BENCH HAND PLANER AND JOINTER.

Write for Bulletin 7-H.

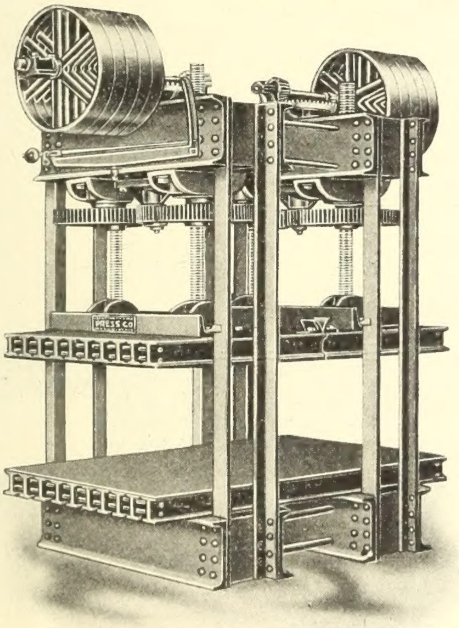
J. A. FAY & EGAN COMPANY

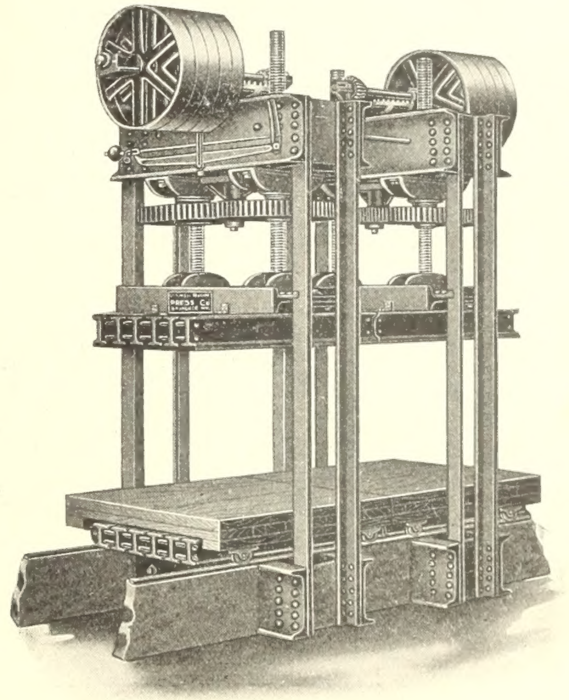
153-173 WEST FRONT ST. **CINCINNATI, OHIO, U. S. A.**

Veneer Presses

Power Screw **Hydraulic**

All Styles **All Sizes**





Track and Car Systems
Transfer Cars

BULLETIN C 1 will be sent upon request

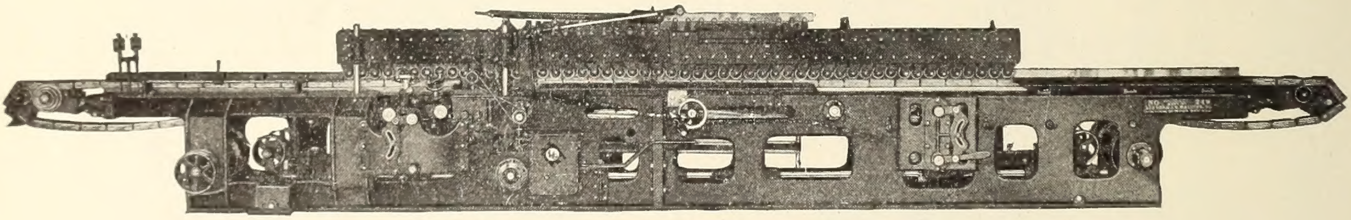
Canadian Boomer & Boschert Press Co.
Limited
Montreal

Who Owns Three Lindermans?

KNECHTEL FURNITURE CO., Hanover, again shows its appreciation of a good thing by installing a Linderman Dovetailer in its SOUTHAMPTON FACTORY.

Hanover Machine	shipped	Oct. 28th, 1911
Walkerton Machine	"	May 9th, 1912
Southampton Machine	"	Dec. 15th, 1913

"The Proof of the Pudding is the Eating"
AND A $13,000 PUDDING IS SOME PUDDING



THE LINDERMAN

is the greatest furniture factory money-saver on the market to-day

It joints, glues, clamps and sizes in one operation, saving not only from 60% to 70% of your annual glue bills, and from 5% to 10% of your lumber waste, but also 40% to 60% of labor.

THE KNECHTEL FURNITURE CO. LIMITED.
FROM THE TREE TO THE FINISHED PRODUCT
TIMBER LIMITS IN BRUCE PENINSULA SAW MILLS AT STOKES BAY TAMARAC ISLAND HANOVER AND WALKERTON
FACTORIES AT HANOVER WALKERTON AND SOUTHAMPTON VENEER MILLS AT HANOVER
D. KNECHTEL. PRESIDENT
HEAD OFFICE
HANOVER. ONT
M. S. ARMSTRONG SECRETARY TREASURER.
J. S. KNECHTEL.

Eventually you will get one. Why not now?

Canadian Linderman Co., Limited

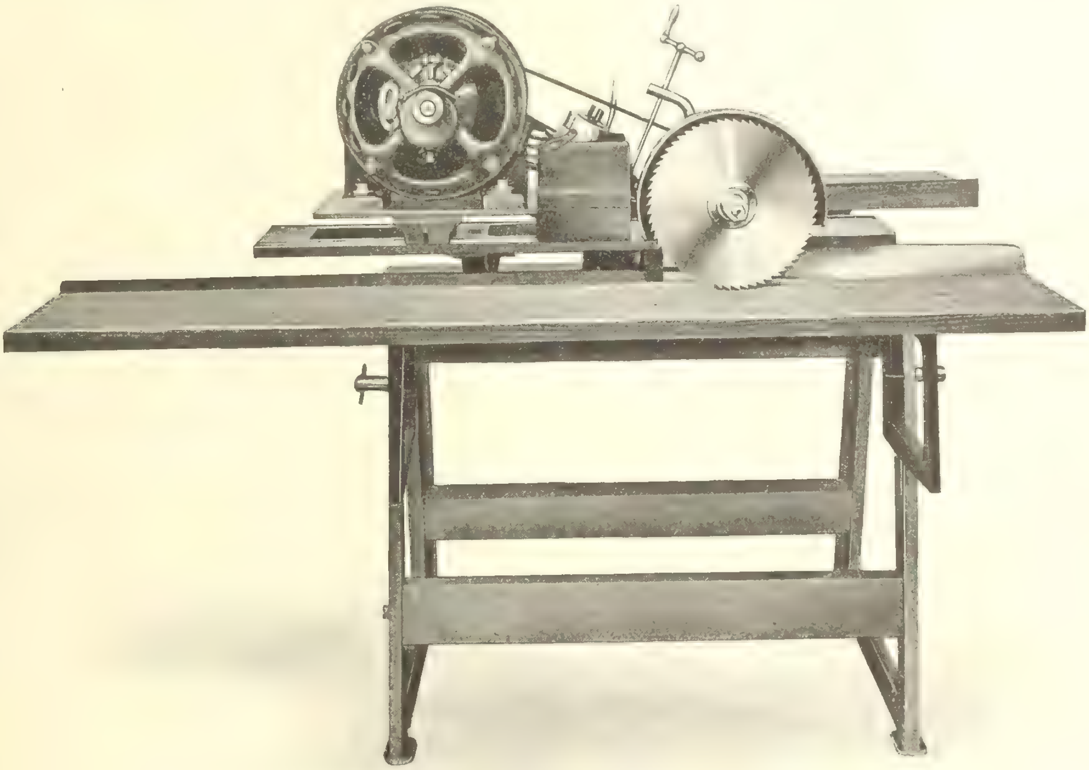
Woodstock : : Ontario

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders, Cabinet Makers Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

Here are a few people who are using our machines:—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

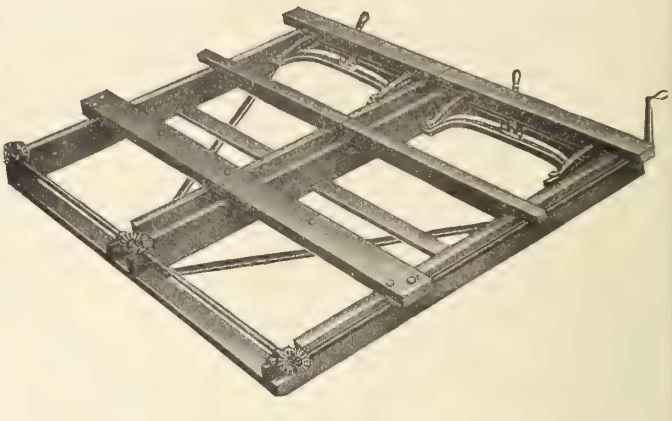
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

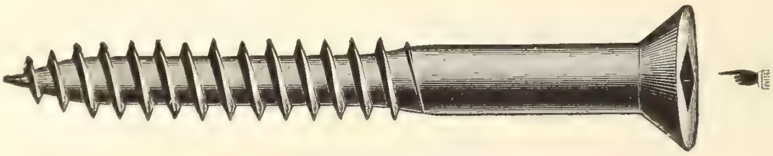
Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.

1456 Front Ave. Grand Rapids, Mich.

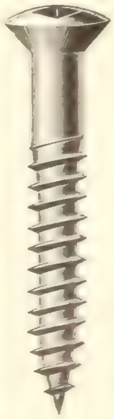
ROBERTSON SOCKET HEAD

Wood Screws



See That Square Hole

Pat. Feb. 2, 1909



THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited

MILTON :: ONTARIO

"Hutchinson" Combination Woodworker

Particularly adopted for

Cutting Studs, Rafters, Braces, Boring for Dowelling, Tenoning, Dadoing, Pulley Stiles, Window Sills and Door Jams, Routing, Stair Stringers, Mitering of any kind, Sandpapering, Ripping, Tool Grinding, etc.

For simplicity of construction, efficiency, durability, portability, rapidity and accuracy of working, there is no other machine on the market to equal the "Hutchinson."

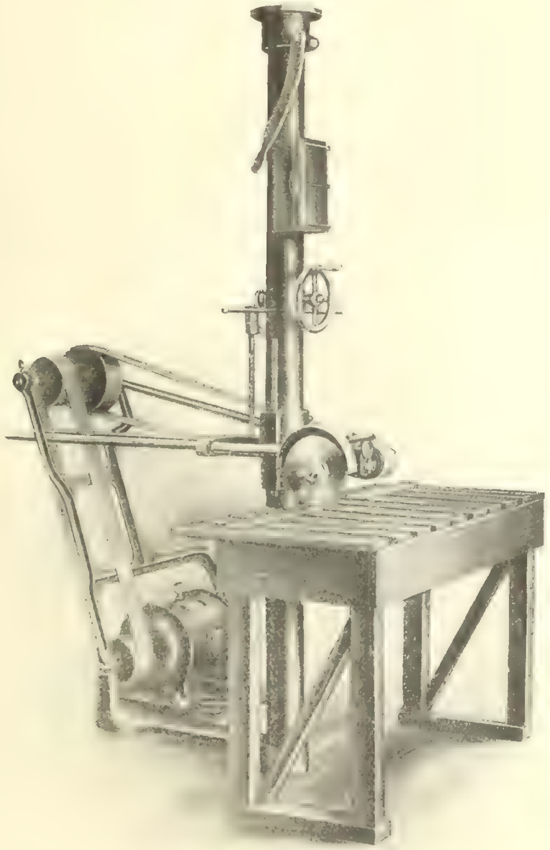


Fig. 1.

With 3 H.P. Motor attached. Motor is attached to iron base plate with rollers adjusted at the bottom and the saw placed at any angle by the steel rod through post as shown in cut. The saw carriage is operated by a hand lever which is carried on two steel rods that slides through babitted bearings in the sleeve and has vertical slide of 24-in. on the centre post. The saw will cut 6 x 16 lumber, and 12 x 12 timber can be cut by turning the stick. The mandrill is raised or lowered by the hand wheel and is held in position by the clutch on top as shown in cut. This machine will do the rough as well as the finish work.

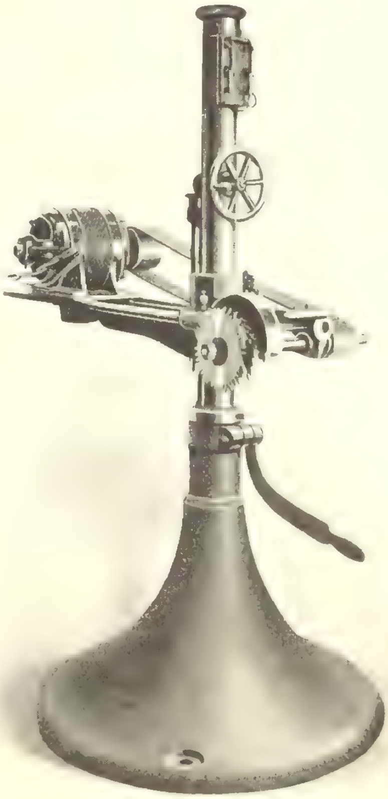


Fig. 2.

Fig. 2, shown above, is a Money Saver in the Shop or on the Building and can be attached to any ordinary electric wires. It is of the same construction as Fig. 1, except that the motor is so attached to the two steel rods and slides with the saw. This machine is more adapted for lighter work, is operated by a 1 horse-power motor, and has no trouble in cutting 4-in. plank. The Iron Column is set with an Iron Base. The Clutch holding the column in position is on top of this Iron Base, and is set by a lever under the bench. This machine is recommended for its portability.

PROOF OF SAVING THIS MACHINE WILL EFFECT

Mr. M. Hutchinson, Toronto.

Dear Sir:—In regard to the machine you installed in my factory, I have given it a fair trial and found it very satisfactory.

I have just finished an order for sorting cases for the Toronto Post Office, in which there were 5000 saw cuts and 1500 dado cuts required.

One man with your machine completed all this in 16 hours, whereas, in the old way, I reckon it would have taken him a couple of weeks.

I have also found it a great time-saver in getting out window frame and stair material.

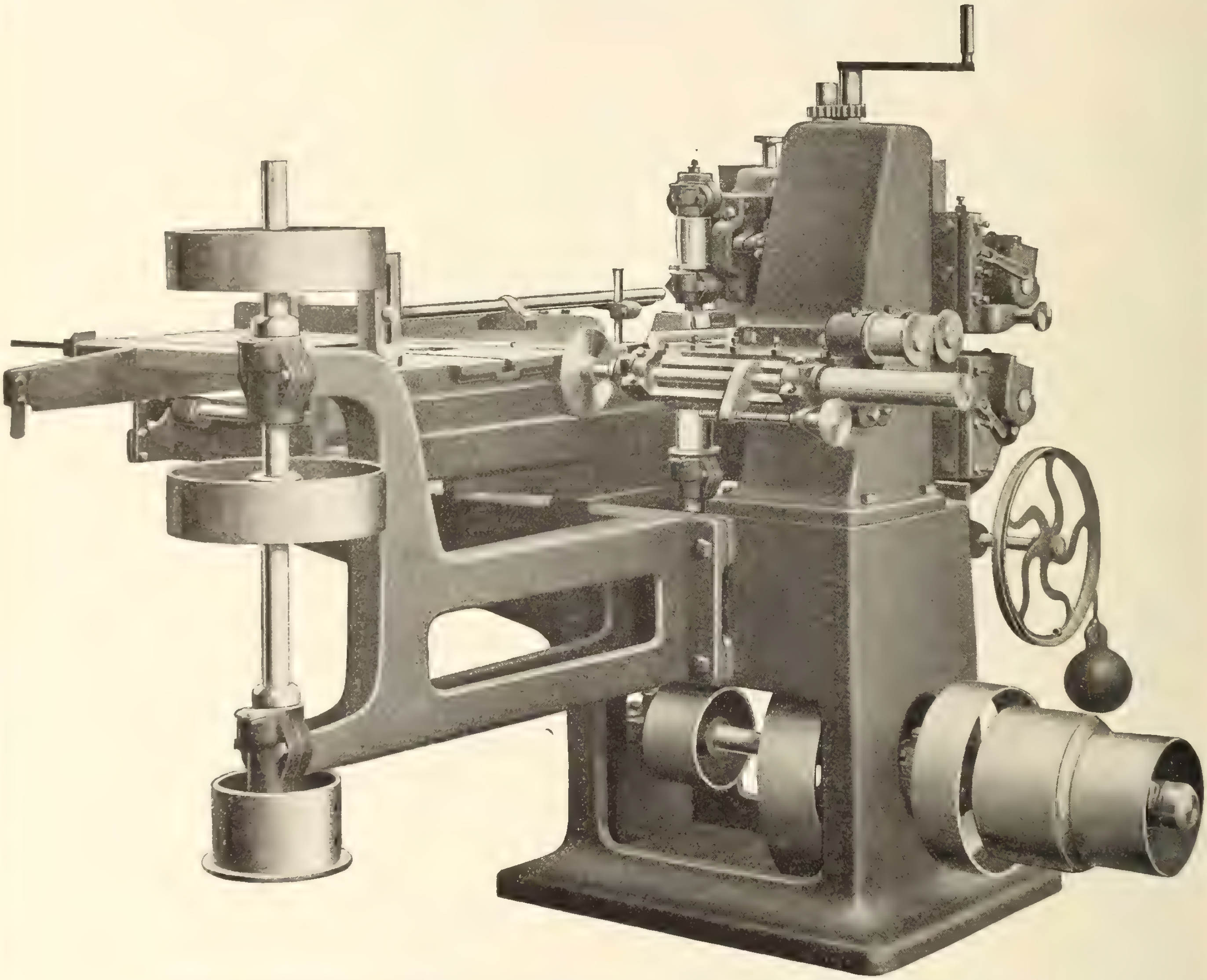
Wishing you continued success, yours truly,

WM. WILLIAMSON,

Office, Mill and Factory: 137-143 Woodbine Ave., Toronto.

MACKINTOSH HUTCHINSON, 5 Duke St., Toronto, Can.

TENONER C.M.C. TENONER



504 TENONER WITH DOUBLE COPES AND CUT-OFF SAW

A new machine embodying every modern and advanced idea of design and construction, which have been endorsed by many experienced users.

Our new Tenoner Bulletin just from the printer ready to be mailed you for the asking.

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Builders of High-Class Woodworking Machinery.

Perkins Vegetable Glue The Product That Sticks

IT IS

A Patented Vegetable Glue which is especially adapted for built-up stock and veneer laying; it is a glue of quality which runs absolutely uniform in every shipment.

IT DOES

Bind veneers together as one piece. It does away with heated cauls or any heat for application in the glue room. It does away with waste in the glue room.

IT DOESN'T

Blister when subjected to heat generated by the friction in sanding; give forth any disagreeable odor; deteriorate on standing over night or even for a number of days.

WE ARE

The originators and patentees of Perkins Vegetable Glue. We are producers, not jobbers. We personally examine every pound of raw material that goes into our product.

WE HAVE

Saved our customers 20% of their former glue bills. We have many satisfied customers and this is proof positive of the value of our product.

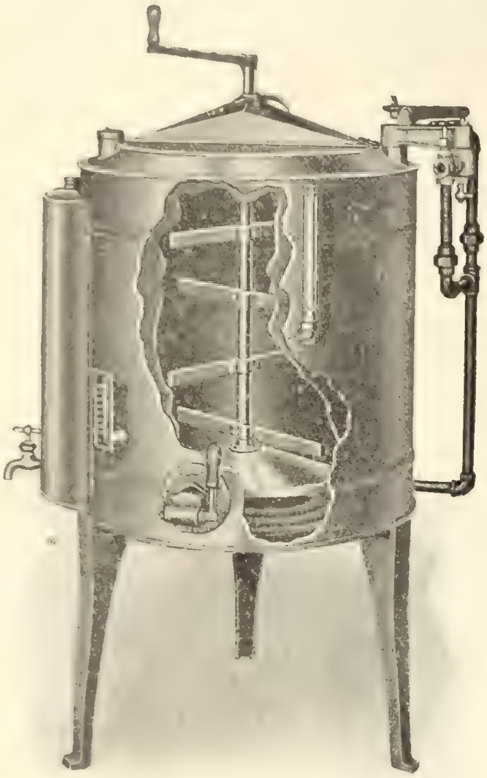
WE WILL

Do for you what we have done for others, and will be glad to tell you all about it either by letter or personal call.

Perkins Glue Company

809 J. M. S. Building **South Bend, Indiana**

Scientific Glue Appliances



Model "A" Steam

If you had time to analyze the economy in handling your glue scientifically—you would see that the saving was far greater each year than the cost of the necessary apparatus.

Glue is becoming too expensive to waste—

The WETMORE stops the waste

Steam Temperature Controller

Electric Heat Retaining Jacket

Thermometer

Water Gauge

Pure Water Chamber Stand

No matter what your requirements in the glue appliance line they can be taken care of scientifically.

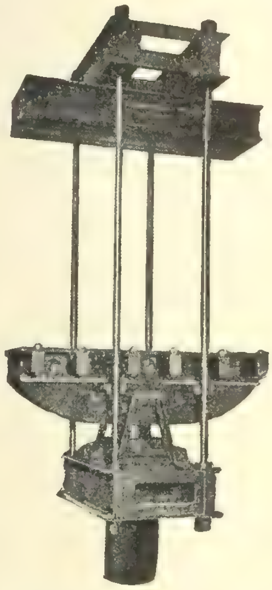
You may write us direct or through our
CANADIAN REPRESENTATIVE

THE J. L. MORRISON CO.
447 King St. West,
TORONTO, ONTARIO

Model "A" Electric

THE ADVANCE MACHINERY CO. Toledo, Ohio

Hydraulic Veneer Press



We build these presses in all sizes and styles for all kinds of Veneer work

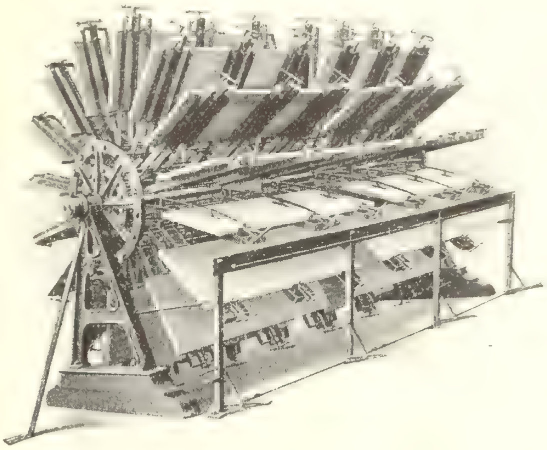
Write us for Price

William R. Perrin & Company
Limited
TORONTO

The PALMER

Perpetual Revolving Clamp

"Built to Last"



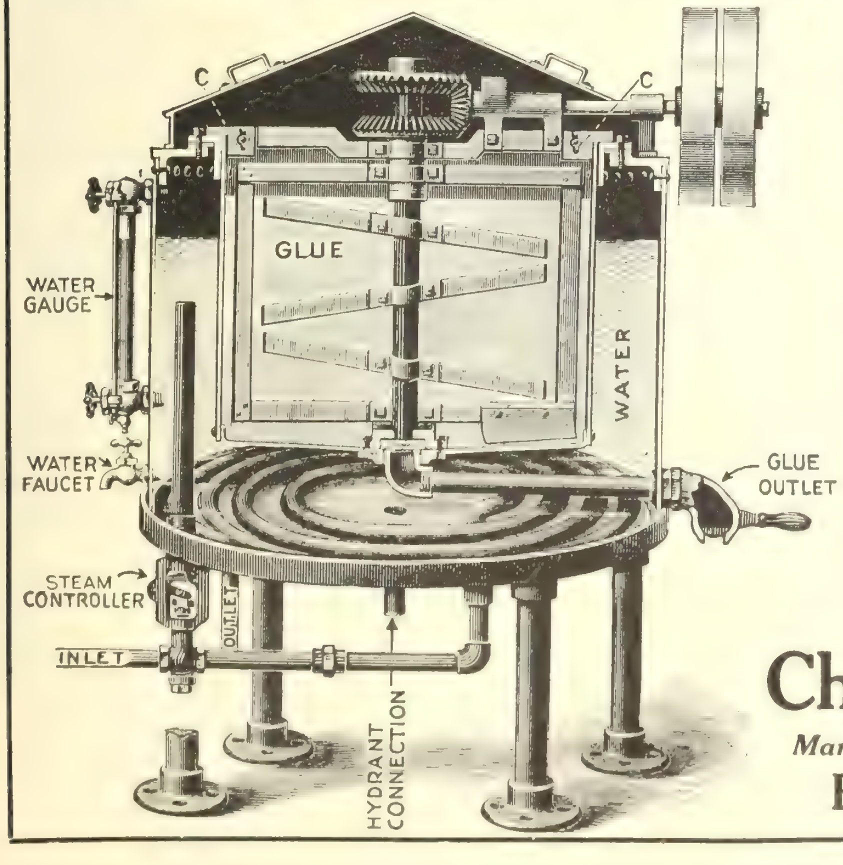
This machine is in successful operation all over America. It helps you with rush orders and cuts down your gluing expense. Built carefully of the best materials.

We also make a full line of gluing clamps.

Send for our Catalog

A. E. PALMER & SONS
OWOSSO, MICH.

A Sure Cure for Glue Troubles



THE heater illustrated will provide a continuous supply of properly heated glue. It has the following essential features of a perfect glue heater:

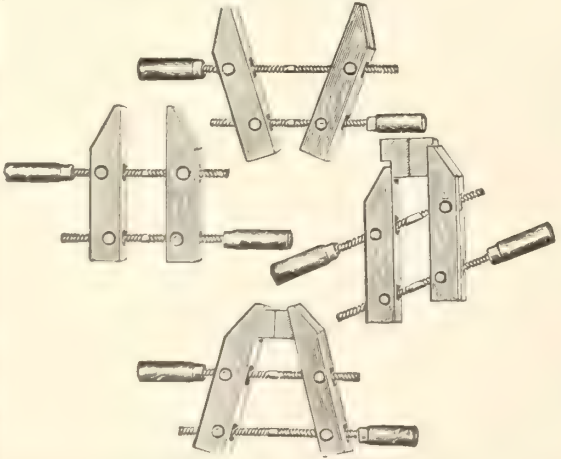
Does not allow steam to come in contact with glue.
Will not burn the glue.
Does not carry too much moisture to the glue.
The water in outer tank is always pure.
The glue is stirred by double acting agitator.
Very little steam is consumed.
The heater is fitted with either our patent glue thermometer or our automatic temperature controller, or both if desired. These essential attachments may be supplied for your present glue heater.

WRITE US

Chas. E. Francis Co.
Manufacturers of Glue Room Equipment
Rushville, Ind., U.S.A.

Alphabetical List to Advertisers

Acme Veneer & Lumber Company	55
Adams & Raymond Veneer Company	56
Adjustable Clamp Company	12
Advance Machinery Company	10
Advance Paint Company	58
Anderson Lumber Company, C. G.	65
Billstrom, Nels. J.	14
Black Bros. Machinery Company	63
Black Lumber Company, Fred W.	57
Boomer & Boschert Press Company	3
Burkholder Lumber Company, S.	66
Buss Machine Works	
Canada Machinery Corporation	8
Canadian Linderman Company	4
Canadian Morehead Manufacturing Company	18
Carborundum Company	17
Central Veneer Company	57
Chapman Double Ball Bearing Company	70
Chicago Machinery Exchange Inc.	63
Clark Veneer Company, Walter	56
Curtis Machine Company	13
Cyclone Blow Pipe Company	16
Dennison, Herbert, J. S.	61
Dominion Mahogany & Veneer Company	59
Duhlmeier Brothers	67
Eagle Machine Works	64
East St. Louis Walnut Company	65
Elliot, W. A.	5
Evans Lumber Company, G. H.	65
Fay & Egan Company, J. A.	2
Fox Machine Company	14
Francis Company, Chas. E.	11
Gorham Brothers Company	61
Goshen Veneer Company	57
Gotshall Manufacturing Company	67
Grand Rapids Hand Screw Company	6
Haughton Veneer Company	54
Hoffman Bros. Company	54
Hossafous, H. E.	57
Huddleston-Marsh Company	58
Hutchinson, M.	7
Jamieson & Company, R. C.	49
Keiths Limited	
Kosse, Shoe & Schleyer Company	67
Lightfoot, Stanley	61
Long-Knight Lumber Company	66
Marrietta Paint & Color Company	72
Morton Dry Kiln Company	17
Nash, J. M.	13
National Process Company	71
National Securities Corporation	61
National Veneer & Lumber Company	56
Ober Manufacturing Company	13
Ohio Veneer Company	54
Ormsby Company, A. B.	16
Palmer & Sons, A. E.	11
Perkins Glue Company	9
Perrin & Company	11
Powell-Myers Lumber Company	66
Pryibil Machine Company, P.	14
Reflector & Hardware Specialty Mfg. Company	63
Robertson Manufacturing Company, P. L.	6
Schmidt Company	49
Scientific American	61
Scrim Lumber Company, W. G.	64
Sheldons Limited	16
Shiels & Company, Chas. F.	67
Shimer & Sons, Samuel J.	71
Sidney Tool Company	17
Simonds Canada Saw Company	71
Sinker Davis Company	15
Smith & Phillips Manufacturing Company	63
Spencer, C. A.	64
Standard Dry Kiln Company	71
Strong Veneer Company	6
Thompson & Company, Lewis	64
Thompson Veneer Company, W. T.	54
Timms, Phillips & Company	64
Toronto Blower Company	61
U. S. Steel Tank & Pipe Company	16
Veneer Manufacturers Company	56
Walters & Sons, H.	18
Wardwell Manufacturing Company	15
Whitney & Son, Baxter D.	1
Wood & Son, Fred	17
Young & Cutsinger	66



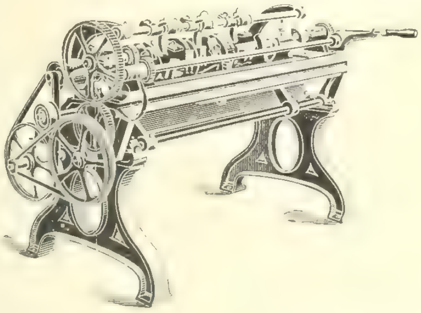
It Should Be Interesting

To know that the JORGENSEN HAND SCREW has proved itself to be so durable that we replace without charge any broken part. This guarantee costs us little, and yet we sell 4,000 dozens a year. Just think of this the next time you figure on the wooden spindle kind that you know you will SOON PAY TO REPLACE if you buy it. The JORGENSEN is in every way a superior tool—but little difference in the first cost.

Adjustable Clamp Company
215 N. Jefferson St., Chicago, Ill.

For the **rapid production** of **Pick, Sledge, Hammer** and **Hatchet Handles, Neck Yokes, Whiffletrees, Ball Bats, Spindles, Table Legs, etc.,** use the

NO. 2 OBER LATHE



We also make **Sanders, Rip Saws, Bolters, Chucking Machines** and **Lathes** for turning both straight and irregular handles.

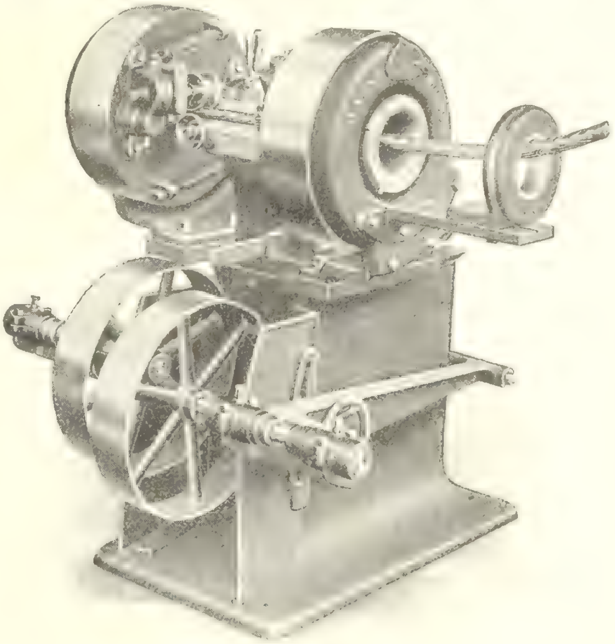
Write for Free Catalogue No. 31

The OBER MFG. CO.
Chagrin Falls, Ohio, U. S. A.

Please mention this paper.

HARD TO GET HAND SANDERS?

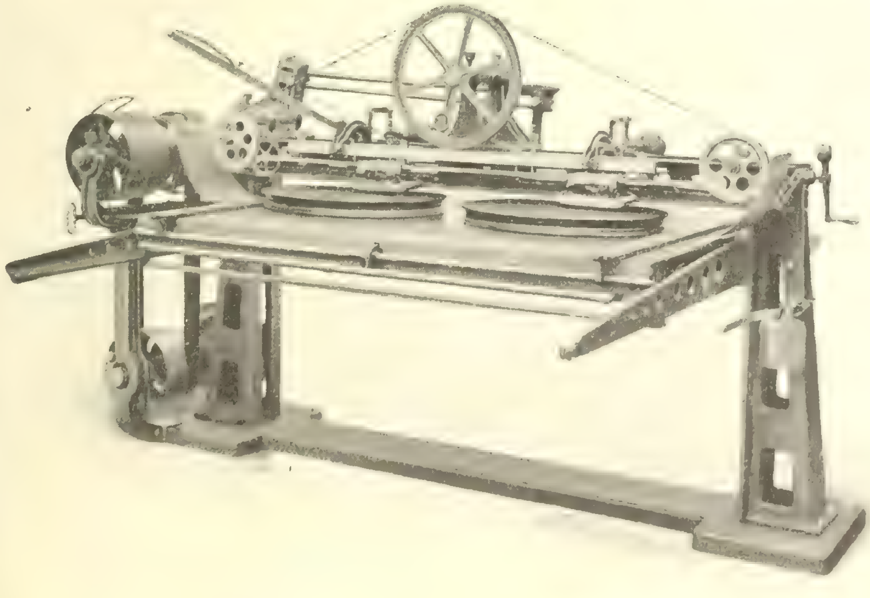
Then let me show you a better and cheaper way to sand your round work.



I have helped others; why not you?

J. M. NASH, Milwaukee, Wis.

Moore Universal Rubbing Machine



The labor saving advantages of this machine are apparent in the accompaning illustration.

The action of a flexible guiding bar ensures a uniform finish throughout. Any required amount of pressure is obtained by an automatic device on the machine.

The accomodation of this machine is for cases up to 39 inches high or stock 6 feet by 8 feet.

The floor space required is 10 ft. x 10 ft. for the 8 foot machine and 10 ft. x 12 ft. for 10 foot machine.

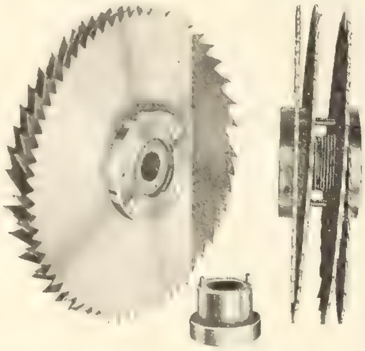
We are Successors to Lucas Machine Co., Jamestown, N. Y., Moore Carving Machine Co., Minneapolis, Minn., and Jansen-Peterson Co., Cleveland, Ohio, and will continue to manufacture the complete lines of all three concerns in our new plant at Jamestown, N. Y.

May we send you literature?

CURTIS MACHINE CORPORATION, Jamestown, N. Y.

Trade **FOX** Mark

ADJUSTABLE



DADO HEADS

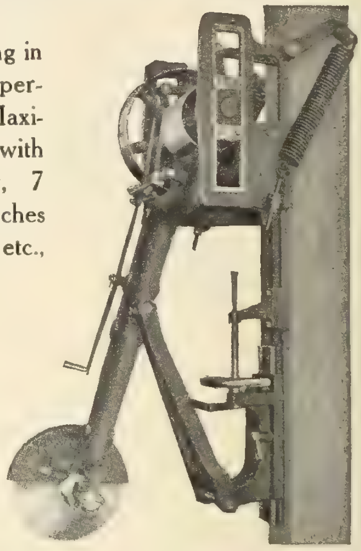
These heads, when open, cut a groove twice the width of groove cut with head closed, and they will cut absolutely any width between these extremes.

Write for Descriptive Literature

FOX MACHINE CO.
645 Front Ave., N.W., GRAND RAPIDS, MICH.

PRYIBIL

No. 5 Parallel Saw and Groover



This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us

1913 Edition

"Practical Pattern Making"

A Practical Work on

The Art of Making Patterns, written by a pattern-maker with thirty years' experience. Contains information on Pattern Making and Pattern-Makers in general, also a detailed description of the necessary materials and how to use them. Then the tools, both hand tools and machine tools, with special chapters on the Lathes, the Band Saw and the Circular Saw, with many examples of work which may be done on these machines.

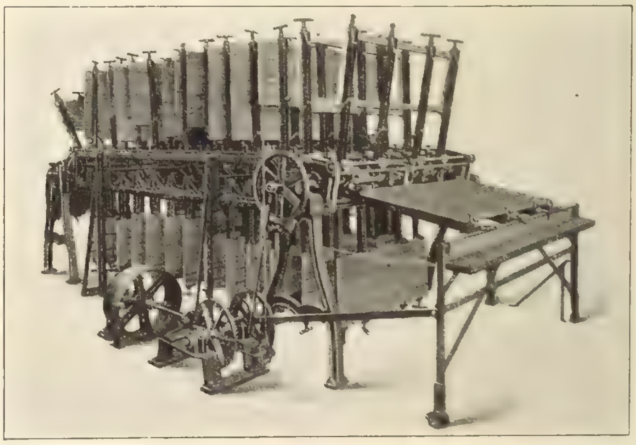
A complete section of illustrated examples of Pattern-Work in wood, with many pages of metal pattern-work, Gating and Plate work. Both Vibrator and Stripping Plates are shown. Specific instructions for plaster work are given, and finally, the cost, marking and record of patterns are explained and illustrated.

By F. W. BARROWS

Price $2.00

CANADIAN WOODWORKER
Nicholls Building, TORONTO

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

Let me tell you where you can see it in operation.

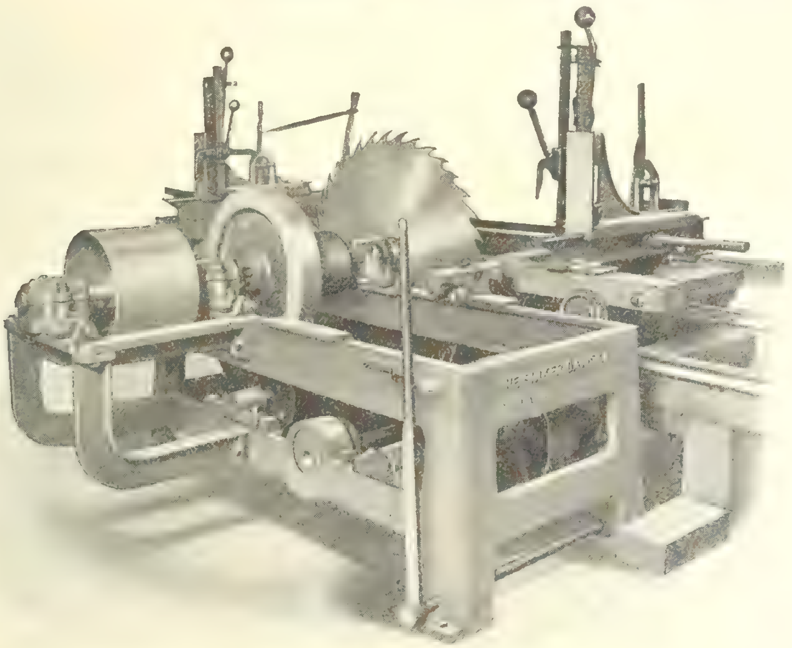
Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

The "HOOSIER" Short Log Sawing Machine

As well built as our largest mill and does as good work.



The Hoosier Short Log Sawing Machine main frame is cast in one piece, which makes it very rigid and this main frame carries the mandrel and the feed works in self oiling adjustable boxes.

On account of the frame being rigid operator can use a very thin saw. The machine is practically self contained and portable and when shipped from the factory includes the track ways and track. We build blocks and carriages to fit all requirements for handling small logs and veneer cores.

For sawing veneer cores we make our improved and grip dogs that dog the cores in the ends and hold them rigid.

For sawing logs whether straight, swell butt or crooked we make a carriage with blocks opening 24-30 and 36-in. with independent knees and Knight's pony single or duplex dogs.

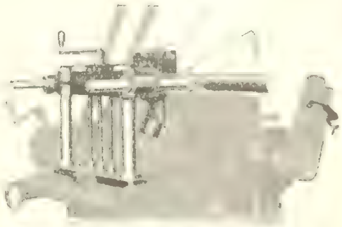
Machine will carry as large as a 54-in. saw and the machine will take care of logs up to 24-in. in diameter.

Write for further particulars regarding this machine and also regarding our New Hoosier Band Saw Mill and our new combination power and hand feed rip saw.

THE SINKER DAVIS CO. - - Indianapolis, Indiana

Manufacturers of the New "Hoosier" Band Saw Mill and All Steel Nigger Proof Head Blocks.

Why Take Knives Off to Grind Them ?



Showing method of attaching to bed

This portable electric grinder saves you all the time spent in removing planer and jointer knives and adjusting them after they are ground.

Not only this, but it grinds them while they are clamped under the same strain as when in use—giving a perfect cutting circle to within 1-1000 of an inch and keeping knives in true alignment with the bed.

With this micrometer precision grinder you can take just enough off the knife to give an edge.

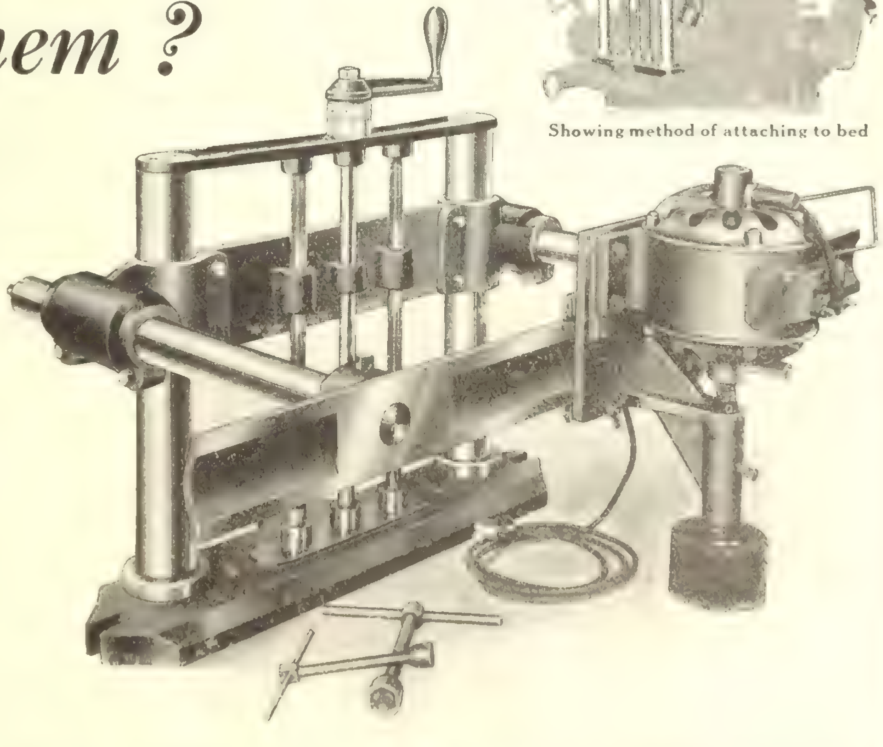
Knives last longer and you can temper them harder. Filing is never necessary and the cost of files is saved.

Your planing will be smoother and require less sanding when you use this grinder.

A postal brings description and drawings.

The Wardwell Mfg. Co.

108 Hamilton Ave., Cleveland, Ohio



Electric Portable Grinder for Planer and Jointer Knives. Can be attached or removed from any planer or jointer in a few seconds and get its power from any electric lamp socket.

(Patented)

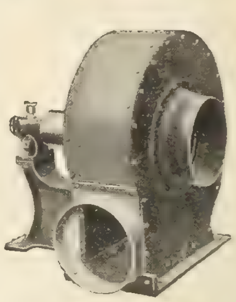
Cyclone Blow Pipe Co.

Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.



Maximum Service

Minimum Repairs

The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

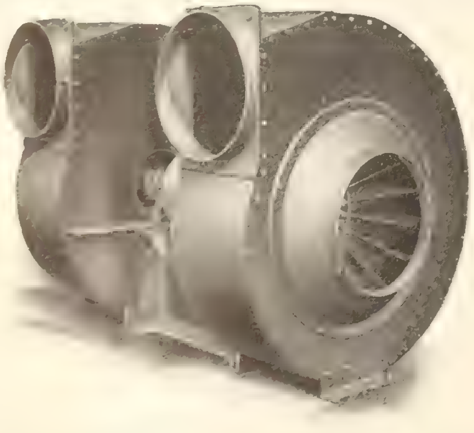
We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs. Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg., Vancouver, B.C.

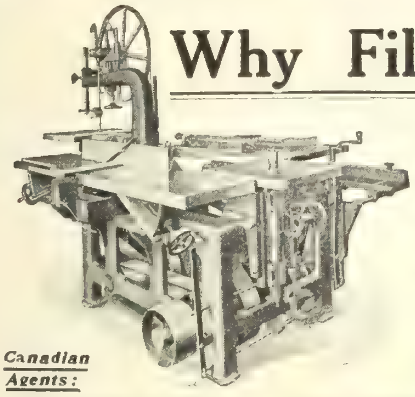


Slow-Speed, Low-Power Shavings and Dust Collecting Systems

Our installations conform to the latest and best practice. New systems designed to fit your present and future requirements. Old systems overhauled and corrected.

The A. B. Ormsby Company, Limited

WINNIPEG *Blow Pipe Department* TORONTO



Why Fill Your Shop With Machinery?

The 1914 Model Famous "31" Universal Woodworker combines 16 machines in one and does 31 kinds of work.

Saves 50 to 100% in first cost, floor space, power, cost of installing and upkeep.

New Catalog No. 25 for 1914 tells all about the "31" and over 50 other money makers for Woodworkers. It's free.

THE SIDNEY TOOL CO., 250 Highland Ave. **Sidney, Ohio, U.S.A.**

Canadian Agents:
The A. R. Williams Mchy. Co., Toronto: Bournival & Co., Montreal: The A. R. Williams Mchy. Co., Winnipeg: The A. R. Williams Mchy. Co., Vancouver

CARBORUNDUM BRAND GARNET PAPER AND CLOTH

WHEN the garnet is received from the quarries—it is analyzed—tested for hardness, sharpness, and purity—crushed, washed, and rewashed—graded absolutely uniform, and automatically coated on the best possible quality of paper and cloth with the highest grade of glue.

Every step in the process is carefully watched—every material used of the highest standard—the result is—Carborundum Brand Paper or Cloth products that will cut fast and clean, show long life—and the grains stay on.

Samples any time you write.

The Carborundum Company
Niagara Falls, N. Y.
New York Chicago Philadelphia Pittsburgh Boston
Cleveland Cincinnati Milwaukee Grand Rapids

SANDING CHAIR ARMS WITH CARBORUNDUM BRAND GARNET BELTS

MORTON MOIST AIR DRY KILN

The Most
Perfect
Dry Kiln
on the
Market

The "Morton" has a reputation for drying oak, maple, birch and beech quicker and better and with less steam than any other method—excepting none.

Write for our New Catalog "W"

Morton Dry Kiln Co., Chicago, Ill.

"Wood's Saws are Good Saws"

Fred Wood & Son

SAWS

135 Richmond St. West, TORONTO

We specialize in the manufacture and repairing of fine Circular Saws for the use of Planing Mills and Woodworking Plants.

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

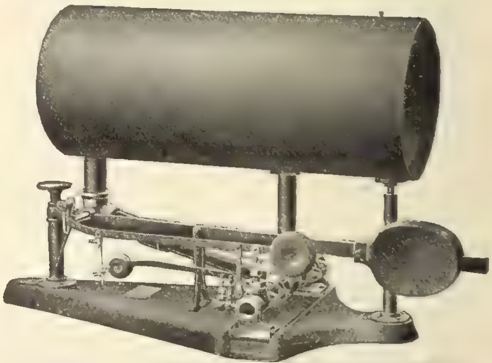
Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited

Hull, Quebec



The Morehead Back to Boiler SYSTEM

will return that water in your Steam Lines to your Boiler.

IF the amount of your steam line condensation is of any volume at all don't waste it. Send for a "Trial Trap" and see how quickly the Morehead System will show savings in your coal bills, repair expenses, etc., not to mention the great improvement in your heating system.

From 20 to 40 per cent. of the heat units in the water of condensation is lost by cooling the condensation down to accommodate a steam pump.

Morehead Traps return the condensation with its full heat content direct to your boiler with practically no drop in temperature.

MOREHEADS TRAPS are being used everywhere on Heating, Drying and Cooking propositions of every kind, from straight pipe work to fan stacks and under vacuum conditions without regard to the difference in pressures between the apparatus drained and that carried on the boiler and without regard to the location of the apparatus drained, whether above or below the water line in the boiler.

There is a Morehead Trap for any kind of service. Just state your conditions and we will send you a Trap for free trial.

DEALERS AND AGENTS: The Morehead System appeals instantly to users of steam. If you are in territory not already covered the opportunity to secure this valuable agency should not be overlooked Application of responsible dealers in unoccupied territory will be given immediate attention.

CANADIAN MOREHEAD MANUFACTURING CO. Ltd., Woodstock, Ont.

Canadian Representatives: George W. Cole, Woodstock, Ont.; Robert S. Bickle, Winnipeg, Man.; H. E. Kirkham, Montreal, Que.
Robert Hamilton, Vancouver B. C.

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring, woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited
Branches: Montreal, Vancouver, Chicago, New York, London, Eng.
Nicholls Building, Toronto
Phone Ade. 929

Vol. 15 January, 1914 No. 1

The Correlation of Design and Woodwork in Manual Training

NOW that increased attention is being given to technical training, a brief consideration of that phase of the subject outlined in the heading of this article will perhaps be timely. In teaching boys to become woodworkers there is no doubt that their interest is considerably increased by allowing them to design their own models, but it is important that this development should be conducted on suitable lines. Ambition for invention is usually strong in boys and it is advisable to stimulate it at an early stage of the training. The scheme of work should be based upon the work already done. For instance, supposing a class has done a little planing and grooving, and has undertaken a simple housing joint: it is usual at this stage to give a small model containing simple grooves, such as a match-box stand or rack, pen-rest, or tooth-brush rack. Now instead of setting a difficult model for copying, the class might be shown two or three examples, given dimensions and allowed to suggest alterations. It is a very dull boy who cannot make a rough working sketch. The sketches should be examined, alterations suggested and then drawn out to full size. The model of their own design should be followed by two or three exercises containing new tool operations and then the class should design another model covering the new work. It must not be supposed that many original models will be produced, but the fact that the boys themselves have made some alteration in the shape or size will assist greatly in encouraging their efforts in the direction of original work.

Where possible, encouragement should be given to simple stencil work, chip or easy relief carving. These subjects are taught at all technical schools of any note. They should be taken up by any student desirous of becoming a first-class mechanic, because they help him to become an expert with tools other than are required by his daily occupation.

There is no reason why simple metal work should not form a means of decoration in some of our woodwork. Take, for example, a small jewel box which can be fitted with brass corners and angle pieces, with hinges of the fish-tail pattern—all made out of thin sheet brass. Hasps and staples and other fastenings are also simple in construction, and the fact that they can be made with a few extra and inexpensive tools provides a strong argument for helping along a little pleasant divergence from the straight path of the all-wood scheme. If such a decoration became popular, we might copy such exquisite pieces of furniture as were made early in the seventeenth century in England and Germany, and which may seen, almost as good as new, in all the large museums of Europe and the United States.

Many handicraft teachers have endeavored to introduce designing into their course, but without success. The principle, however, should not be condemned because of this, and a continuous effort should be made —if on revised lines.

It must be remembered that it is impossible to carry out any design without a knowledge of what is required, and if suitable models or sketches are provided for the first few pieces of work, the value of subsequent efforts will be considerably enhanced.

Lumber Drying Processes

SCIENTIFIC Lumber Drying was the subject of an interesting paper read before the National Veneer and Panel Manufacturers' Association at Chicago by Mr. Z. Clark Thwing, of the Grand Rapids Veneer Works, Mich. After mentioning that, in general, commercial varieties of lumber had been divided by scientific investigators into three groups—namely, non-porous, diffuse-porous and ring-porous he discussed the various methods for drying lumber which have served woodworkers and saw mills during the last hundred years. Referring to the distinct evolution which indicated an increasing efficiency and growing comprehension of the treatment necessary to rapidly and safely remove the moisture from the wood without injuring the fibre, he pointed out some of the deteriorating effects of air-drying certain kinds of wood. A feature of what he termed uneven drying which made the bake-oven dried lumber unsatisfactory for commercial use was the fact that the lumber was over-dried on the outside and under-dried inside with the result that it was always liable to change shape after it was planed, dressed, ripped or re-sawed. From this he inferred that the bake-oven kiln was being rapidly relegated to the scrap-heap. During the last decade there had been a rapid change of front on the part of those interested in securing scientific and accurate results in the use of lumber dry kilns. This was due partly perhaps to the general movement all over the country towards a keener public consciousness and partly to the more extended application of practical chemistry and physics to the woodwork manufacturing trades while the modern efficiency expert was another indication of the progressive spirit. It had remained for the last few years to develop a dry kiln in which careful attention had been given to the control of opera tion and to the three absolute essential functions of lumber drying, viz., humidity or moisture, temperature or heat, and ventilation or circulation. Two control methods were in general use to-day. These were the so-called condensing kiln and the expansion kiln. The condensing kiln had been designed on the basis of air-circulation—in other words the air in the kiln is circulated over and around the lumber and at certain regular intervals passes over cold water pipes or open water sprays where some of the moisture is condensed; the air thus relieved of part of its moisture passes on again to do additional duty in again absorbing moisture from the lumber and yielding to the condenser. If the moisture-charged air is exhausted from the kiln instead of re-circulating and fresh air drawn in it is obvious that nature will do the duty devolving on condensors in this type of kiln. "The expansion kiln" said Mr. Thwing " is the latest development of the lumber drying art because we have adequate control of heat, humidity and circulation." Humidity control meant that that water vapor in the atmosphere of the kiln could be increased or decreased at will. The lumber on entering the kiln could be immersed in a hot fog which would be absolute safeguard against casehardening and its attendant evils. This hot fog maintained to a degree through the entire drying process was an absolute preventative of fire in the kiln.

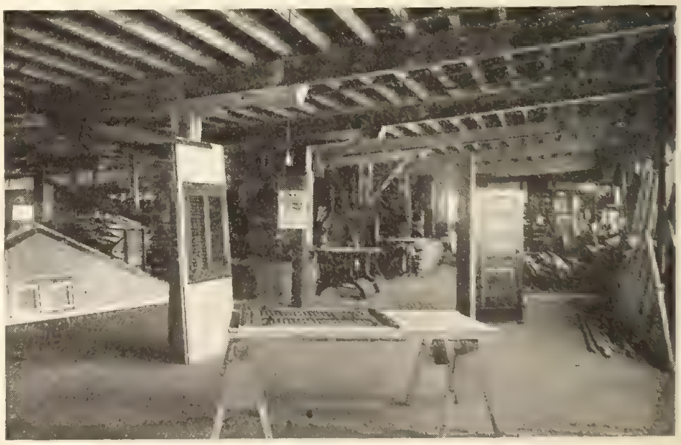
The efficient ventilation of the dry kiln had been notoriously disregarded by the practical woodworker. Effective circulation could never be obtained except through the admission of fresh or dried air and the removal of the dead air in accordance with practical laws. No practical man would think of having an outlet for saturated air at any height along the side of the kiln because at such a point the air would be taken out of the kiln before it had done its full service absorbing the moisture from the lumber. It was necessary therefore to so design the kiln that only the saturated air would be drawn out. Woodworkers were beginning to realize that the proper drying of lumber was of the utmost importance to their success. Instead of assigning the operation of the dry kiln without regard to the intelligence of the operator the time was rapidly approaching when the kiln would be operated systematically, when the records would be more important than those of the watchman, when the temperature and humidity would be as closely watched as the water column and the steam gauge, when the lumber will be as carefully tested as the costs of manufacture and selling are now computed.

The Operations of a Brantford Woodworking Factory

THE Schultz Brothers Company, Limited, Brantford, Ont., have one of the largest and most up-to-date woodworking factories in Canada devoted to the manufacture of builders' supplies. The firm have been in business for more than half a century and are amongst the oldest and most enterprising in the Dominion, whilst their woodworking products have achieved a reputation for high quality which is known over practically the entire American Continent. A description of the factory, together with a number of typical photographs, which we reproduce, should prove of interest to those associated with the woodworking industry.

The woodworking plant of the Schultz Brothers Company is right in the heart of the city, its central position in Brantford's go-ahead district affording it an undoubted advantage to the company, especially owing to its proximity to the railway company's sidings. The building is of three storeys and is of solid mill construction, the material used being white brick throughout. It has a frontage on Waterloo street of 124 feet and on Albion street of 398 feet. The factory is well lighted in every part, great attention being paid to the convenience of the employees, who have ample facilities, therefore, for the production of thoroughly efficient work. An immense space is taken up with their three yards, and the fact that they carry about six million feet of stock gives some idea of the resources of this enterprising company. A few of the numerous lines handled are:—Lumber, laths, shingles, cedar posts, frames, doors, sash, builders' supplies of all kinds, packing cases, and besides they are the sole makers of the Knoll Washer. They also carry a large quantity of manufactured materials in their stock sheds, ready for prompt delivery. In this respect special attention has always been given to builders' supplies of all kinds, and the fact that they have erected some of the finest buildings in the Dominion is of

First Floor—Box Department—Assembling.


Third Floor—Portable Buildings Department

itself sufficient to set the stamp of reliability and quality upon their contracting work. They have grown up with the times, and the reputation they have gained for good material and first-class workmanship is one of the satisfactory features of the firm's operations.

Naturally the equipment of plant to be found in any large factory has an important bearing upon the quality as well as the quantity of the output of the finished article. In this connection at least a description of the Shultz plant will be of interest. On the first floor the sizing, matching and surfacing is done in large quantities, also mouldings of all kinds from the largest down to the smallest. Hundreds of different patterns, plain and ornamental, are in use, the importance of the work demanding the greatest care and skill. The machinery installed is of the latest and most up-to-date, the Canadian makes including two moulders of the Ballyntine type, two moulders of the Goldie & McCulloch type, two double surface planing machines supplied by the Berlin Machine Works Limited, one matcher of the McGregor, Gourlay & Company type, and two small feed rip saws installed by Goldie & McCulloch. In addition to these makes several United States made types of modern machinery are at work in the factory. The boilers are each 72 ins. x 18 ft. and carry a working pressure of 120 lbs. The engine is a Wheelock, with rope drive, the whole power plant being of Goldie & McCulloch manufacture. Strictness to detail in everything is an important feature of the company, the motto being to provide customers with what their plans call for. In this, as in most other respects, they have been peculiarly successful.

First Floor—Ripping, Planing, Matching, Sticking and Resawing

In the box department, situated also on the first floor, all kinds of boxes from the small box for mailing purposes to the big packing box are made, nearly all their output in this department being absorbed in Canada. Of the box machinery the 30 ins. double surfacer and the 64 ins. band re-saw were installed by the Berlin Machine Works, Limited.

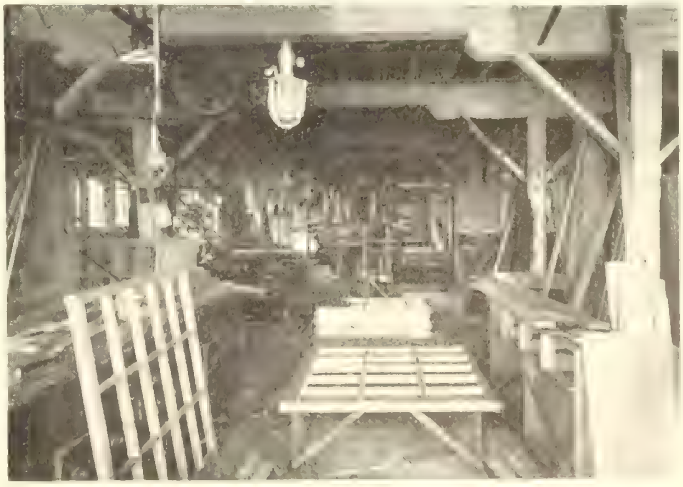
The second floor is devoted entirely to the manufacture of sash, doors, frames, stairs, cabinet work, store and office fittings. It may be said that many different varieties of woods are employed in the process of manufacture, amongst these being:—White, Georgia, Norway and Mexican pine, basswood, walnut, mahogany, birch, chestnut and maple, plain and quartered oak, ash, sycamore, fir, spruce, Ontario and British Columbia cedars, hemlock, elm and beech. The woods are imported from all part of the country, and the greatest care is always exercised in the matter of choice, a large quantity of foreign woods being used for interior finish and fittings. All the factory machinery is conveniently located in rows on the different floors, and the shafting is operated by transmission endless rope drive from the engine.

Third Floor—Novelty Department

The third floor is a very interesting place. Here a great variety of work is done, and to mention but a few of the lines will afford some idea of the quality of the work turned out. These include portable houses and churches, portable garages, wheelbarrows, washing machines, crokinole boards, triangleo boards, ironing boards, pastry boards, bread boards, folding clothes bars, etc. Besides these many articles in the novelty line are also a feature of the productive end of the factory. On emerging from this department the novelties find a ready sale all over the Dominion and even across the Atlantic where the English markets demand well manufactured goods.

Whilst the company specialize in builders' supplies, their motto all along has been to win the confidence of their customers generally, by the superiority of the finished article. The firm make no pretensions of covering the whole country with their goods, believing as they do that it is better to supply a more prescribed territory and in so doing fulfil all requirements satisfactorily.

The stock sheds situated in the lumber yards are



Second Floor—Machine Department Only—Bench and Stair Departments to right kept fully stocked the year round, so that the woods for factory use are thoroughly seasoned as a result. The shipping facilities are eminently satisfactory, the firm being well catered for by the Grand Trunk Railway and the Canadian Pacific Railway, both of which lines run accommodation sidings convenient to the factory. The company usually employ between 200 and 300 men, a great many of whom have served from ten to thirty years with the firm, which speaks well for both.

The manager, Mr. J. S. Schultz, has had a life-long experience in all branches, which is very necessary to a well-conducted business, and to his efforts a large share of the company's success is undoubtedly due.

A Few Points in the Handling of Glue

By William Stetter

THE careless handling of glue has been brought to the writer's attention so often that an article dealing with the subject may be the means of effecting an annual saving to woodworkers in the use and proper handling of this most important of articles. Few woodworkers seem to realize what an important part glue plays in their business. Would your product be of any value without the assistance of glue? Can you afford to handle this question carelessly? How much time do you spend, Mr. Woodworker, in trying to get all you can from the glue you are using?

It is not my intention to tell you how to run your factory in regard to the handling of glue. That is entirely up to you, but in following the advice offered here it is safe to state that it may mean a saving to you of many dollars a year as well as a better finished product. There is only one way to handle this question properly and that is the right way.

Buying, the First Consideration

The first step towards handling this question begins with the buying. Taking for granted that your buyer is a competent man and that your are getting full value for your money let us proceed to the main source of disturbance in glue—the workroom. Workmen who have handled glue for almost a life-time really know very little about the subject and in few cases are capable of getting all there is to be had from glue unless proper methods are installed for handling and using. It is not fair to expect a good workman to turn out a first-class article unless he has the proper tools. As a supposition I will assume you are getting a good grade of hide glue at a reasonable price; the question is then left entirely to the workman. Are they equipped to turn out first-class glued stock? Do they make the most of it and get out all the strength and adhesiveness from the glue that could possibly be obtained?

Glue consumers are apt to ridicule the suggestion that they measure the glue and water carefully at the proper proportions, but this is the only way of obtaining the best result. By this it is not intended that you should weigh each pound of glue and each pound of water by a scale. This would surely take up considerable time, but, you can obtain tin-pails for measuring the glue which will hold a certain number of pounds when levelled and this does not take any more time than the methods you are now using. This same method can be employed in measuring the water. Always bear in mind, though, that the same proportions must be used throughout the handling. You must first ascertain, therefore, just how much water the glue will take to obtain satisfactory results on your work. This information having been obtained see that the workmen measure the right proportion of glue and water by means of the tin-pails. Always remember that glue is animal matter and sure to decay. Too much soaking, as too much cooking, kills the strength of glue. Where ground glue is used, soak in cold water fifteen to twenty minutes, being sure to stir when the water is added so that each grain of glue will absorb the moisture. If the stirring is eliminated it means a waste of the glue which the water has been unable to reach. Where flake or sheet glue is used soak at least twelve hours and it is best to soak this in a covered kettle in order to minimize evaporation. Stirring is not required with flake or sheet glue as there is always enough space between the pieces to allow for proper absorption.

When the glue has been soaked the required length of time and ready for cooking, be sure that the pots are thoroughly clean. Turn on the heat until it reaches a temperature of 130 or 140 deg. Fahr., when it can be turned low and then gradually increased until it reaches a temperature of about 150 deg. Fahr., at which temperature it is ready for application on your joint. To obtain all adhesiveness and strength that glue contains it should never be cooked above the latter temperature, otherwise you will be cooking the strength from it. It must be understood, of course, that thermometers are required for gauging the temperature and if they are not already attached to your glue pots it is very simple and inexpensive to have ordinary round glass thermometers suspended from a string or wire and reaching to the centre of the glue liquid. Thermometers for this purpose can be obtained for fifty or sixty cents.

In applying glue to the wood be sure that the brushes are perfectly clean and free of foreign substances or dirt. Never use glue on green wood or wood which is not thoroughly dry. Heating the wood is a good method but not absolutely necessary unless it is kept in a very cold place, in which case it will chill the glue. If the wood is kept in a moderately heated room no other heating is required. Steam heat should be used where obtainable as by this method of heating the temperature can be gauged almost accurately, so that little trouble, if any, is experienced in holding the glue liquid at the proper temperature. Where gas heat is employed this is a very difficult matter. Copper pots or kettles are the best to use because they do not affect any kind of glue as is the case with kettles made of other metal where glues which contain certain acids are affected; in some instances causing discoloring or a quick tendency to spoil.

A very good plan, and one which has proven of benefit for handling the soaking of glue, is to have one man attend to all the soaking or it might be worked out by each glue-worker assisting in turn, by which method considerable time could be saved. In order to be carried out successfully the average daily consumption must be ascertained. Then a small tank or galvanized ash-can which will hold the required amount could be filled each night or morning with the proper proportion of flake or ground glue as the case may be. From this the individual glue pots could be filled for the day's supply, thus assuring uniformity throughout. This would also eliminate carelessness on the part of individual workmen.

The following seven rules are here set down for the guidance of gluemen:—1.—Cleanliness, 2.—Measure glue and water accurately. 3.—Soak glue in clean, cold water and be sure to stir thoroughly. Ground glue requires fifteen to twenty minutes' soaking; flake glue twelve hours. 4.—Dirty pots must never be used in cooking glue. 5.—Cooking glue over 150 deg. Fah., kills the strength. Do not boil glue. 6.—Melt glue thoroughly before using. 7.—Dry, moderately warm wood is best for applying glue.

Automatic Sprinkler Systems as an Investment

By Alvin T. Coate

IN these days of fire prevention education it is getting to be more clearly regarded as an offense against the public welfare when property is lost by fire, and this is the correct point of view. When, in addition to satisfying this sense of moral duty, a financial return can be secured from the installation of fire apparatus, a most happy combination is presented.

Chief and foremost in all the appliances for the protection of business property is the automatic sprinkler equipment, and the minds of manufacturers in particular are turning toward this apparatus in increasing numbers. Plants are being thus equipped which but a few years ago were thought to be too small to render such an equipment advisable, or where mechanical and engineering difficulties have recently been removed. It is very desirable that manufacturers whose plants are not equipped should have some rule or plan by which they may determine for themselves, in at least an approximate way, whether in their particular plants such an equipment is feasible, and it is in the hope of furnishing some such rule that this article is written.

Automatic sprinkler equipments combine naturally with such other apparatus as elevated gravity tanks, fire pumps, electrical supervisory alarms, steamer connections and others, but fortunately not all of this apparatus is necessary to secure substantial benefit from the sprinkler equipment itself. Indeed, it would seem that the cause of fire prevention in many instances may have been hindered by laying stress upon equipment so elaborate that it is at once put beyond the reach of hundreds of small manufacturers, who can ill afford to do without such protection as they are able to buy and maintain. In a general way it may be said that all of this accessory apparatus here mentioned is for the purpose of guaranteeing the efficiency of the sprinkler equipment in its hour of need, rather than of adding to it. A single source of water supply is sufficient, provided that supply is ample in quantity and always dependable.

A study of the causes of fire loss in sprinkler equipped properties will disclose the fact that many of these plants were equipped with two or more sources of water supply, but that, jointly or singly, they were inadequate, that the equipment itself was improperly installed, or that a fire attacked the building from the outside or underneath, gaining such headway as to put the equipment wholly or partially out of use before the heads were melted.

There are two considerations which determine the practicability of sprinkler equipment: First, protection of the property and business; second, the reduction of the insurance cost. These considerations should always be joint in determining the matter. Each manufacturer knows in a general way what his destructible property is worth. He knows what percentage of this destructible value he is able to keep insured and what the cost of this insurance is. He knows, also, the amount of his operating profits and something of the business loss which would be incurred by the destruction of his plant. From 75 to 95 per cent. of his insurance cost can be eliminated by the sprinkler equipment, and fully as much of the probability of fire loss obviated. These, then, are the credit side of the considerations.

The cost of the equipment will, of course, vary according as it is elaborate or simple, has the water supply close at hand or distant, the buildings compact or scattered, and the expense and maintenance is high or low in a general way and subject to these variations. The inside equipment will cost from $2.50 to $4 per sprinkler head, while the cost of the outside connections and valves can be with considerable accuracy determined by the length of the mains and the number of valves required. In this calculation the mains connecting the water supply and equipment should not be less than 6-in., and the number of valves will be determined by the number and proximity of the buildings.

A sprinkler head is required for each 64 sq. ft. of ceiling or roof surface, including stairways, decks, mezzanine floors, etc. The same principle may be stated in this wise: A one-source equipment, including the mains and valves, will cost (subject to the varying conditions before mentioned) somewhere near 7c per square foot of ceiling or roof surface, while a two-source equipment, which includes elevated gravity tanks, will cost somewhere near 10c per square foot for the roof and floor surface. If these means of determining the equipment cost do not seem sufficiently accurate, manufacturers will always find the makers of sprinkler apparatus willing and ready to submit their own estimates from a sketch of the plant.

If a further analysis of the question is desired, it will be found that the highest percentage of return upon money invested is upon the internal equipment, with its single source of water supply. This is of special importance to veneer and woodworking plants of moderate money value, where a municipal water supply is available. The one thing which need be said the oftenest and loudest is that the small manufacturer should investigate the cost and result of the single-source equipment. If he wishes to add to this the elevated tank or pump, or other apparatus, after his saving in insurance cost has fully or to a considerable degree reimbursed him for the original outlay, he may, of course, do so.

The unfortunate fact remains, however, that hundreds of woodworking plants which have been lost by fire, would be standing today if a single-source equipment had been installed in them, and such an equipment would have paid a sufficient return upon the investment, simply by way of reducing the insurance cost. It is further true that there are hundreds of such plants now unequipped whose owners could pay for the equipment, together with the interest on deferred payments, in a few years' time, out of the saving in insurance cost, leaving out of account altogether the larger consideration of protection to their property and business.

Cost of Maintenance

Naturally the query arises, What is the cost of maintenance after the equipment is in? Here, again, much depends upon the kind and extent of the equipment. The maintenance cost of a single-source equipment in woodworking plants is very small. If the buildings are not heated, and a dry system must in consequence be used, there is, of course, some expense in maintaining the necessary air pressure, although neither the cost of the apparatus nor the upkeep is large. The cost of preventing water in elevated tanks from freezing, in cold climates, is probably the greatest single element of maintenance expense. This expense is determined largely by whether steam is always kept up regardless of the sprinkler apparatus, and whether additional fuel and firing are required to furnish steam for heating the water.

The factor of repairs and maintenance of the equipment itself is not considerable. Out of 100 inquiries addressed to manufacturers of many different classes, an average expense of 10 per cent. for maintenance and deterioration was found, but a large majority of these manufacturers have two and three-source equipments, with fairly severe winters to contend with. The principal cause of deterioration is corroding acids or fumes, and where these are not present deterioration is almost negligible, as the upkeep expense will be relatively small.

Speaking directly to such wood-workers as veneer and panel plants, planing mills, furniture factories and allied trades, it may be said that, in a general way, where the annual premium paid amounts to $800 or more upon a premium rate of 2½ per cent. or more, a one-source equipment can be profitably installed. It ought, in some manner, to be impressed upon every manufacturer that if a consideration of these statements convinces him that he could profitably install such an equipment in his own plant, he owes it as a duty to the public welfare to install it forthwith. The present fire loss ratio in the United States is a conspicuous and humiliating shame to every citizen, and constitutes a considerable element in their ability to successfully compete with the manufacturers of the world.

A special treatment of native woods for use in the better grades of furniture has been tried with success in Germany. Freshly cut birch, oak, elm, or spruce is buried in earth mixed with lime and other materials, and left for from three to five months. A remarkable fine color is imparted to the wood so that it can be used without painting or staining, and after this treatment it has practically no tendency to shrink or swell.

Commercial Value of Oak Floors

ONE of the first things which an individual instinctively notices on entering a residence or building is the flooring. This is especially true if that individual contemplates purchasing the building. The prospective buyer is quick to note oak floors, as they give a touch of character and quality. Any building with oak floors is distinctive and individual and possesses the extra commercial worth and saleability that belongs to distinctive things. Real estate men in their advertisements, almost without exception, make a point of mentioning oak floors if the building to be sold has them. This one thing has proven a big factor in making sales. Even in the unfurnished house oak floors create an atmosphere which is friendly, and this material is considered by architects as second to none to the various floorings used. The machinery used in the oak flooring factories of to-day is different from that used ten years ago. Oak flooring is milled to-day with an exactness, under expert inspectors, which requires but very little scraping by those laying floors. All of the manufacturing process is given close inspection and floors are frequently made up for testing purposes. After being milled, this flooring is separated into the different grades and tied in bundles. The temperature of the warehouses is carefully regulated to keep the stock in normal condition and on leaving the factory it is as near perfection as is possible to make it. Many dealers through ignorance or carelessness, handle oak flooring as they would lumber and store it in damp places. This is a grave mistake. A good plan is to keep the oak flooring in a warm cellar or a dry room in the house in which it is to be laid for at least a week or ten days. Oak floors are often badly damaged by improper laying and scraping.

The Miscellaneous Uses of Beech

FROM a bulletin on the use of beech, which has just been issued by the Department of Agriculture, we are informed that this wood is the favorite material for wooden shoes, the manufacture of which has reached considerable proportions in the United States. These shoes, the Department says, cost from 60 to 75 cents a pair and are good for two years. They are worn by those who have to work in cold or wet places, such as tanneries, breweries, and livery stables, and by workmen in steel mills and glass factories who must walk on hot grates or floors. Farmers, too, are classed among the users.

Beech wood is put to a much wider range of uses than the average person would be likely to suspect. We walk on beech floors, eat off beech picnic plates, carry beech baskets, play with beech toys, sit on beech chairs and in dozens of other ways use articles made of beech almost every day of our lives. Its freedom from taste fits the wood especially for articles which come in contact with foodstuffs, and beech meat boards, skewers, lard tubs, butter boxes, sugar hogsheads, refrigerators, dishes, spoons and scoops are widely used.

Only one species of beech grows naturally in the United States, but few trees in this country have a wider commercial range. It extends from the Gulf of Mexico to eastern Canada, and in practically every place where it grows it is cut for market.

How to Build a Sanding Table

Combining an old Machine Stop Lathe with a Home-made Sanding Table and Producing a Useful Tool

By Ira S. Griffith

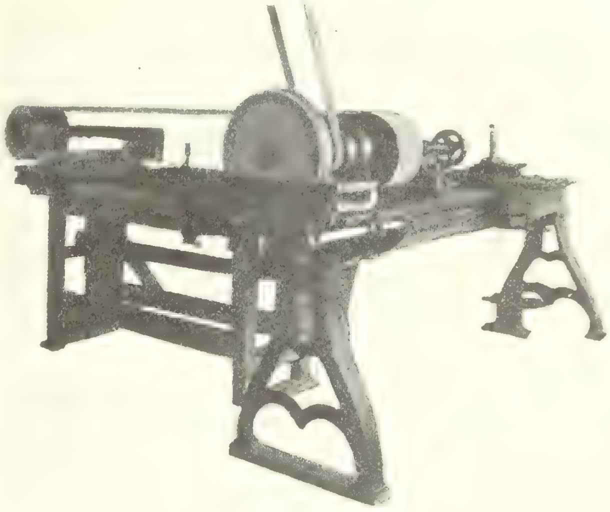
NOT infrequently one runs across articles bearing upon home-made machines for use in woodworking shops. Of course, it is somewhat more agreeable for one to be able to order his machines from the manufacturer but it frequently happens that there is no alternative but to make one's own machine or go without. There are, too, slack seasons when a man might as well be putting in his time making his own machine as not—the time or labor cost under such circumstances making it profitable to build rather than to buy.

The writer remembers well, before the day of the gasoline engine a hand circular saw built by his father out of scrap materials of another machine which had served its usefulness and had been sold to the junk dealer. That saw table was made portable and was carried about from job to job and, while it was a "man killer" it certainly saved many dollars during its long life. In this day of cheap and reliable gasoline power one need no longer depend upon human muscle.

The accompanying picture and drawing show an ingenious sanding machine built by Mr. Harry Hurff. Mr. Hurff was limited as to funds and so used his available money for mortiser, etc. The rip-saw he built himself—and it is thoroughly satisfactory for the use to which he puts it. He is now building a shaper making use of scrap material of machines from the machine shop.

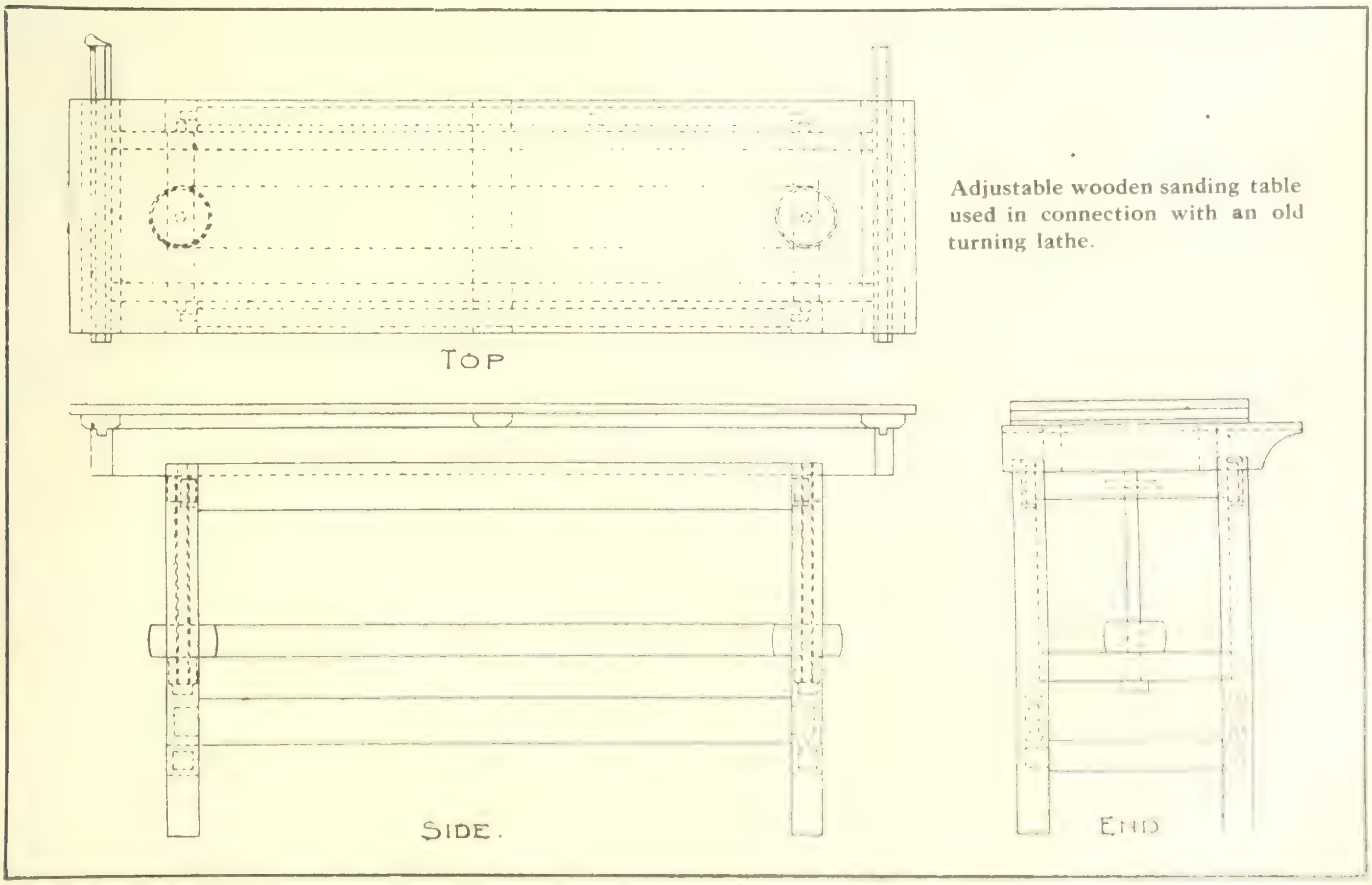
This sanding machine was made out of an old lathe which had been cast aside by the machine shop as no longer fit for their use. This was rigged up as shown in the illustration with a pulley for carrying the sanding belt. On the outer end of the shaft is affixed a disc in front of which is a table adjustable to various angles with reference to the face of the disc. On the opposite extremity of the belt is another pulley of the same size as that on the lathe, carried upon an arm firmly fixed to an adjustable slide which makes it possible to tighten the belt or loosen it.

The two pulleys which carry the belt are home-made and the segmental work is finely done. This pulley building is another thing the carpenter may be interested in and we shall describe it in detail in a later issue.



Sanding table rigged up with old turning lathe

The climax of ingenuity is reached in the adjustable sanding table. The table top slides in a horizontal position carrying the stock under the belt to the



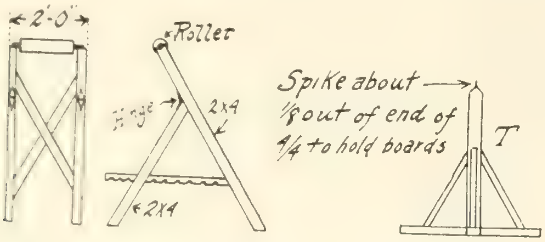
Adjustable wooden sanding table used in connection with an old turning lathe.

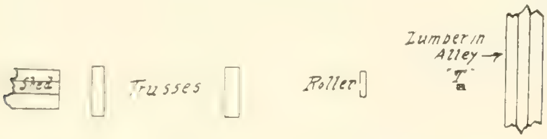
most suitable position. Using the screws from some wooden hand clamps and attaching two pulleys to them and connecting these with belting the table may be adjusted to the vertical height desired, both ends of the table being carried up level one with the other.

To insure each of the adjusting pulleys moving alike and to prevent the belt from slipping, small brads at regular intervals engage holes in the belting. The sanding pad is easily made and is shown in the picture in position.

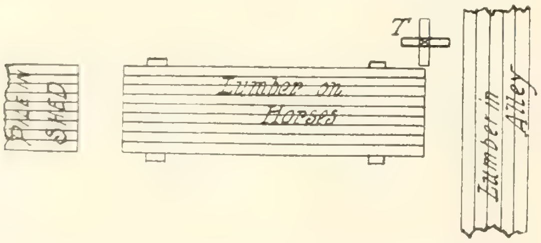
Labor-Saving Devices

Messrs. S. Q. Lamm & Son, of Bulter, Ind., are using some labor-saving devices that while we call them the lazy man's friends, we know from actual experience that one man can pile just double the amount of lumber a day by their use that he can by walking back and forth from one side of the alley to the other with a board to place on the pile. First we have a "T" used in swinging the boards around on trestles. The trestles are arranged so the boards are within about two feet of the end of the pile. We have two sets of trestles, one set about three feet high and another six feet high for raising the boards so as to make piling easier when the pile gets high enough to stand on platform.





In piling heavy joist or where we have to move lumber over 20 feet to the pile we use a roller arranged on legs that can be raised or lowered from two feet to six, which used in connection with the "T" enables our yard man to pile quicker and also he does not have to bear the weight of each piece, as in swinging it around on the roller he only lifts one end and lets the "T" and roller do the work.



Herewith is a rough sketch of our method and also of the roller and "T." If any dealer is interested, we could give him a detailed description of them. Our yard man is doing just about twice the amount of work he did before we put them in.

There are three species of birch of commercial importance in Canada, the black, yellow and white, or paper, birch. The former two have the more valuable wood, but are confined to eastern Canada, whereas the paper birch is found in every province of the Dominion, ranging to the limit of tree-growth towards the north and growing well within the Arctic circle in the Mackenzie River basin and in the Yukon. It is this wide range which contributes largely to its importance, but the qualities of the wood promise a still greater use in the future, for it is a strong, hard, fine-grained wood which takes a high polish and can be stained to imitate the more expensive woods, such as mahogany, cherry or walnut.

Reducing the "Working" of Wood by Kiln-Drying

A great source of annoyance to all woodworkers and users is the tendency of the material to shrink and swell with changes in atmospheric conditions. This is due to the fact that wood substance is hygroscopic—that is, it attracts or absorbs moisture from the air. Increase in the moisture content of fairly dry wood causes it to swell, and drying out causes it to shrink. This property of wood can be reduced, but not entirely eliminated, by subjecting wood to boiling, steaming, prolonged soaking, or exposure to high temperature.

To determine just what effect kiln-drying has on the subsequent moisture condition of wood as compared with simple air-seasoning, a number of tests were conducted by the Forest Service in co-operation with the Yale Forest School. The test specimens were of two sizes, 2 x 2 x 6 inches and 2 x 1½ x 30 inches. These sets of seven pieces each were taken for each of three species, and for each of the different temperatures used. One set was simply air-dried and used as a check (C) with which to compare the other two sets of that series. Another set (A) was first air-dried for about a year, then kiln-dried, and finally placed aside with the check specimens to air for a year or more. The third set (B) of the series was soaked from the green condition for the same length of time that the other sets were air-dried, was then kiln-dried with the second set and placed in the air.

A comparison of the water content of the pieces that were kiln-dried first with that of the pieces that were only air-dried showed that in no case did the kiln-dried material absorb as much moisture as the other.

For example, air-dried and water-soaked red oak blocks were kiln-dried at maximum temperatures of 145 deg., 170 deg., 212 deg., and 274 deg. They were then exposed to the air for a year or more and their average moisture content at the end of that time determined. The results were as follows: At 145 deg., previously air-dried (A), 7.6 per cent.; previously soaked (B), 9.6 per cent.; check specimen, air-dried only (C), 12.4 per cent. Similarly for the other temperatures the figures were: At 170 deg., (A) 10.6, (B) 10.6, (C) 12.4; at 212 deg., (A) 9.4, (B) 9.5, (C) 12.0; at 274 deg., (A) 8.9, (B) 9.9, (C) 12.6. From these figures, each of which is an average of seven tests, the reduction in hygroscopicity due to kiln-drying appears to be a permanent change by some fundamental change in the wood substance.

The degree of dryness attained, when strength is of prime importance, should not exceed that at which the wood is likely to remain in use, but where reduction of the hygroscopic properties of wood are of first consideration it should be carried out to as great a degree as possible and subsequently brought back to the condition under which the wood is to be used by exposure to the air for some time before the lumber is manufactured.

QUESTION BOX

A Practical Department of Reference for the Practical Man

INAUGURATED under the above heading is a permanent department which we hope will be regarded by readers of the Canadian Woodworker as a permanent source of information and consultation. It is designed to be a ready reference for the practical man and to afford satisfactory solutions of the difficulties encountered in the workshop and factory. It is intended as a medium of exchange between men of experience in different branches of the industry: between the specialist in the single field on the one hand and the man of general experience on the other—the man who wants to know something about a specialized field. A number of interesting practical topics are discussed below and we trust that our readers will be sufficiently interested not only to peruse the answers and replies, but to submit a brief discussion of any points which they may find of special interest and concerning which they may have supplementary information to offer. The Canadian Woodworker cordially invites its readers to take an active interest in the Question Box. Practical problems illustrated where possible by diagrams are of special interest.

Question. What is the most economical form of fire protection for woodworking factories?

Answer.—There are many ways of guarding against fire, such as installation of stand-pipes with outlets on each floor of the mill, with plenty of hose; hand chemicals—which, by the way, no mill, should be without; water barrels and buckets, fire drills, etc. But large and expensive as the undertaking may seem at first thought, there is nothing that compares in any way, including efficiency and economy, with the automatic sprinkler. The best thing for you to do is to communicate with your insurance people. They will give you full information and quote you rates which will bring the proposition down to dollars and cents. You will probably find that the saving in premiums will pay for your complete installation within three or four years.

Question.—What is the best belt dressing?

Answer.—There are many belt dressings on the market, most of which are by-products from some chemical operation, and they are of very doubtful value to the mill operation. No dressing that makes a belt stick to the pulleys should be used in a woodworking establishment, for the same qualities that make the belt stick to the pulley make everything else stick to the belt and the close contact is destroyed. Use castor or neatsfoot oil in very small quantities—just enough to keep the belt soft. If it slips with a good soft face on it, it is either too narrow for the work it is doing or it wants taking up.

Question.—What causes the teeth of band saws to crumble when shaping the points.

Answer.—Try putting a little oil on the points before swedging. Be sure to get the swedge even on both sides and do not swedge the tooth any wider than is necessary to give it the necessary clearance.

Question. Are tungsten lamps practicable in woodworking mills?

Answer.—They certainly are, if installed and used properly. Put them high enough to be out of reach. Enclose them in good locking guards. Use a wall switch and operate the lamps in groups of five or six if possible. Never use them where they will be handled, and if there is excessive vibration, use the little springs which are made for the purpose. Do not get the lamps too large, remembering that a forty-watt lamp gives over twice the illumination of a 16 c.p. carbon lamp and uses a little less current. Do not put the lamps too high so as to light up useless space—about eight feet is good.

Question.—The firm has ordered some new machinery recently without making any provision for additional power. The engine is at present overloaded. Can we get more power out of it, and how?

Answer.—It is pretty hard to say with the meagre information you have given. However, think over the following. Perhaps one or more of the suggestions is what you want:—

See if your fans are not running too fast and taking too much power. Use a gauge and see what your draft is. Perhaps a slight change in the piping will make it possible to slow the fans. Put in slow speed runners.

See if the shafting is in line.

See if some of the belts are not too tight or too heavy, which amounts to the same thing.

Get your engine indicated, and see if the valves are in good shape. Perhaps you need a new piston ring, or the cylinder needs boring, or the valves want setting differently.

Cover your steam pipes and use your steam dryer and hotter. Install a condenser.

Put roller or ball bearings on your line shaft.

If all this doesn't do the trick, put in a motor and buy what power you cannot make until it is convenient to enlarge your steam plant.

Question.—If a bearing persists in running hot, is there any material I can use with the oil which will cure it?

Answer.—Not permanently. Graphite or mica dust sometimes work in emergencies, but they should never be used in a ring oiling bearing and the surest way is to try the following in the order named, which will certainly stop the trouble permanently:—

Scrape it to a good fit, and clear the oil runs.

Be sure it has plenty of good clean oil.

Is the belt too tight or too heavy?

Be sure the shaft is straight.

Use a harder babbitt, and be sure it has a full bearing. Try a larger bearing or a roller bearing.

Woodworking Processes in an Ontario Piano Factory

ONE of the flourishing industries of our smaller London, familiarly known as the "Forest City," is the Sherlock-Manning Piano Factory, illustrated herewith. The woodworking departments in this particular branch of the industry are universally recognized as being thoroughly up-to-date in their practice and the following particulars cannot fail to be of interest to some of our readers.

In a trip through the plant, one's attention is first devoted to the machine room. Here we find automatic and self-operating machines, such as self-feed rip-saws, continuous-feed jointers and three-belt sanders especially adapted to the work. The Sherlock-Manning Company claim that the self-feed rip-saw was the first of its kind to be installed in a Canadian piano factory.

Varnish department

Rubbing and polishing

The life of a piano, like many another product, is intimately bound up with glue, and so particular interest attaches to the glueing and veneering departments of such a plant as the one illustrated. The foundation of a piano is actually the heavy back to which the other parts are attached. This back is called upon to support tons of tension and is held together entirely by glue. We are told that the glue used in the Sherlock-Manning factories is imported direct from Germany. (Here would appear to be an opportunity for the home manufacturer.) The company has been using the same quality of glue for fifteen years, at the rate of more than a ton a month.

After the case is veneered it goes to the case room to undergo hand scraping for a smooth surface. Then it is sand-papered by two specially adapted belt machines.

The next department is the filling and staining room. Although the cases are veneered with walnut and mahogany they are stained to proper proportions—a work, we are told, which requires the ability of an atrist to give each instrument the proper blend.

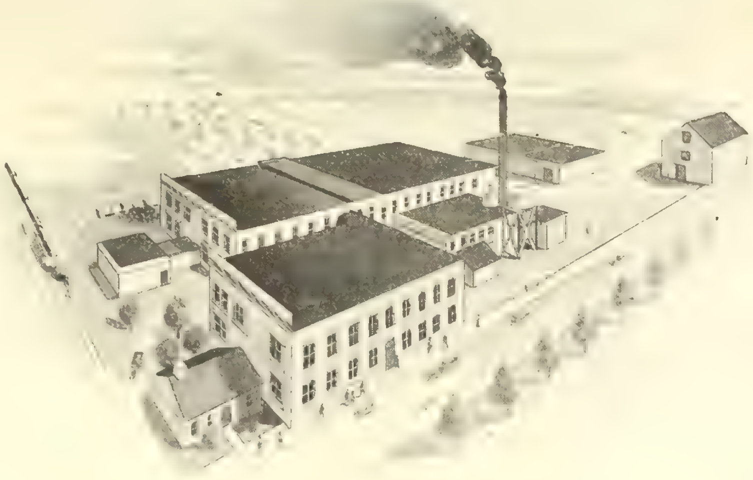
Each part of a piano is varnished separately, so that there shall be no white spots at any of the joints. This brings the importance of the varnish room in line with that of the other departments. In the London factory, each piano is given five or six coats of varnish, it being held that this provides an absolutely safe foundation for the rubbers and polishers.

The sanding, rubbing and polishing department is shown in one of the illustrations. The rubbing machine, which has only been on the market a few years, has proved a great labor-saver in this department,

Filling and staining.

Stringing and chipping.

Machine room.



Bird's-eye view of the Sherlock-Manning piano factories.

Case room.

Glueing and veneering.

Bellying department—Sherlock-Manning piano factory.

where machines of the latest type are operated by compressed air.

In another department the process of crowning the sounding boards takes place. The crown on the sounding board is sustained by ribs on the back. These ribs are made from quarter-cut southern spruce. On the face of the sounding board, rock maple bridges are used, while the sounding board proper is of a high grade of quarter-cut spruce. An idea of the number of operations on a piano may be obtained from the information that there are 739 borings on each back alone. The work of boring these holes is reduced considerably in this plant by the use of a radial, flexible arm-boring machine, a feature of which is that four backs may be bored at one setting. The sounding board is sandwiched in between a heavily-constructed back, made of elm, on the one side, and a heavy steel plate on the face.

The other departments are not identified so intimately with the work of the practical woodworker, but enough has been said to convey a general idea of the more important phases of piano-making. The accompanying illustrations will supplement our information.

In the Nodon process of seasoning timber by electricity, the newly felled trees are sawn into thick planks and laid on a false floor, one on top of the other, with the interposition, however, of moistened matting or similar material between each layer to act as electrodes for the introduction of an alternating current which is passed for ten hours or so. The effect of the current is to produce chemical changes in the cellulose and the sap, rendering them impervious to decay. Further, the sap loses those gummy and hygroscopic characteristics which normally prevent rapid drying. It is claimed that timber thus treated is ready for use a few weeks after it is felled, and is harder, stronger, more homogeneous, easier to work, and less warped by moisture than timber which has been seasoned by the ordinary air-drying process.

Action regulating and hand-polishing at the Sherlock-Manning piano factory.

Operating the Jointer

THERE are so many little machine details, writes Mr. W. H. H. Rohr, in Wood Craft, especially on the simple machines having no regular operator, that become worn and out of order and are let go until they are quite an annoyance and a real drawback to fast and accurate work.

The jointer, for instance, in a shop I once worked in was handled so carelessly that the treads on the hand bolts, which hold the fence solid to the table, became bruised and worn so they would not take hold of the threads in the holes of the table.

Finally one of the men took time to examine them and found that the threaded part A, see Fig. 1, screwed up into part B and was held by a 3-16-inch pin C, which went entirely through part B. The pin C was driven out and A readily unscrewed from B, after which A was turned end for end and the worn part screwed up into B, leaving the good threads projecting. A 3-16-inch hole was then drilled into the worn end of A and pin C replaced, leaving the hand bolts as good as new.

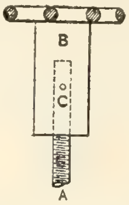


Fig. 1—Correcting ill-used jointer screw.

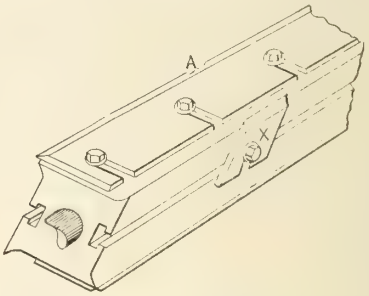


Fig. 2—Remedying mishap with knife.

This jointer was equipped with a guard, but it was used by only one of the men and when he worked on the machine he had to arrange the guard in place. He did so one day while the machine was running and a projecting bolt struck the knives, resulting in a deep, ugly nick, see A, Fig. 2. There was only one set of knives and lots of wide stock to face up, so the gap was bridged by bolting on a pair of straight sticker knives on the slotted sides of the head in line with the nick, see X, Fig. 2.

When facing up stock on the jointer, an arrangement, Fig. 3, was often used. It not only aided in pushing rough stock over the machine, but decreased the danger of the operator's hand slipping off into the knives.

Another little kink to lighten the work of facing up long, wide stock was simply a lump of paraffin wax, which when rubbed over the table has the same effect on it that it does on a ballroom floor, viz., makes it smooth as glass. As a machine-bed lubricant it is better and more lasting than oil, besides it does not stain the stock.

Cost of Manufacturing Slack Staves

THE cost of manufacturing staves and other cooperage materials must be figured for regions as well as for kinds of wood and kinds of stock produced. A schedule of cost items which might hold in one part of the country, and for staves of a certain kind, might be wholly misleading if applied where conditions are different. Timber in one region may not cost half as much as in another, and there may also be considerable difference between sections in the cost of labor, power, rent and overhead expenses. One region cannot be compared with another without allowing for such differences as affect the price of materials and cost of manufacture.

A number of factors must be taken into consideration in arriving at cost. Timber is usually the largest item, though it is not always so. Inquiry among slack coopers in various parts of the country shows that there is by no means a set scale of prices for logs or for bolts delivered at the stave mill. In fact, some slack stave makers pay twice as much for their raw material as others pay. Difference in cost is not always due to differences in kinds and quality of wood purchased, nor in distance, it must be transported to reach the mill. Log markets are usually local, and makers of slack staves profit or suffer on account of this more, perhaps, than most manufacturers of forest products.

Sometimes the stave maker is tempted to do what the sawmill man too often does, count his stumpage at too low a figure. If he buys the logs he generally puts them in at the proper cost, for he knows exactly what it is; but frequently he has owned the standing timber or both it and the land for same time. They came into his possession when they were cheap, and he is apt to forget that values have gone up. Consequently, when such a man sits down to figure what it costs him to make staves he is tempted to put the logs in at about what it costs to cut and haul them; imagining that by overlooking the stumpage cost or value he is making his profits larger. Real profits are never increased by forgetting to add in some of the cost items.

The overhead expenses are frequently ignored or forgotten in estimating cost of production. Here is an other case where apparent profits may be considerably increased by forgetting a few items; but the deception will have no effect on the real profits.

The ostrich thinks it is hid when its head is stuck in the sand, but it finds out better when it is caught; that is about the wisdom shown by the manufacturer who treats overhead expenses as "a matter which the business will take care of." It is a mighty small business that can be carried on without due provision for overhead expenses.

Probably the manufacturer misses it less in footing up the cost of actual production—aside from the material and the overhead expense—than in any other part of his bookkeeping. He knows to the cent what he pays as wages, rent, insurance and incidentals, and it is simply a matter of arithmetic to add the items. The ship owner finds that the dangerous rock is the one hidden beneath the water; any sailor can miss a visible cliff. So with manufacturing: the trouble comes from the cost items which get into the business but never into the ledgers.

Figures on cost of producing slack staves, taken from reports by manufacturers in various parts of the country, show differences so great, in some instances, that the most reasonable explanation is that some operators forget important items, while others make a clean showing of everything. It is well known by persons who have investigated the industry that operators are far apart in their cost figures. This doubtless accounts for the willingness of some slack stave makers to sell their product so near the bedrock of actual cost that there is no margin of safety in the figures.

Figures on Production

Examples culled from various manufacturers' reports will clearly show how much more cheaply one man can make (or thinks he can make) slack staves than another can do it. Something must, of course, be allowed for different kinds of staves. There are different thickness, widths, lengths, grades, and woods; but as far as possible like will be compared with like in the following items, if any comparisons are made.

A stave maker in the mountains of Virginia buys chestnut stave bolts at three dollars a cord of 128 cubic feet, and pine at fifty cents a cord less. On the basis of 1,500 staves to the cord, the cost of production is given as follows for chestnut:

Material for 1,000 staves	$2.00
Manufacturing	1.65
Cost of selling	.10
Overhead expenses	.00
Total on board cars	$3.75

If pine instead of chestnut is used, the cost is about thirty-five cents a thousand less. No mention of overhead expenses is made, and if it is considered at all, it is figured in the manufacturing or the selling; but as both of these items are quite low, the presumption is that the item was overlooked.

A manufacturer in southwestern Ontario who buys maple, beech and elm, pays $20 a thousand feet for logs delivered at the mill. He says the "logs are scaled to cover waste." It may not be quite clear just what that means, for in converting logs into staves, at least half of the actual wood is waste in the form of sawdust, knots, shake, defective staves and other rejected parts. Some figure the waste as high as seventy per cent. That is, if logs weighing 10,000 pounds are made into slack staves the actual weight of the finished product might run from 3,000 to 5,000 pounds. That, however, depends largely on the character of the logs, and the manner in which they are worked, and an average percentage of waste for one kind of timber on one size of staves would not necessarily apply where circumstances are different. Supposing, however, that in Ontario 1,000 feet of logs, costing $20, will make 3,000 staves, the cost as given is approximately as follows:

Material for 1,000 staves	$6.65
Manufacturing	2.75
Selling	.00
Overhead	.00
Total	$9.40

It will be noted here that nothing is allowed for overhead expense, or for selling. It is stated that no expense of that kind is incurred. The difference in cost between these maple, beech and elm staves and those in Virginia made of pine and chestnut is from $5.65 to $6 a thousand. The question is, how can manufacturers compete when so great difference exists in cost of production?

A Missouri manufacturer of staves and hoops submits figures on the cost of different kinds of logs, but gives no data showing what the cost of manufacturing is. Delivered at the mill the cost of logs is given:

Gum logs per 1,000 feet	$7.50
Elm logs per 1,000 feet	9.00 to $10.00
Ash logs per 1,000 feet	11.00 to 12.00

The cost of elm for hoops runs from $12 to $14 per 1,000 feet in the log to $15 to $17.50 in flitches. These prices are from $1.50 to $2.50 higher than those of two years ago.

Another Missouri manufacturer gives no cost data for logs or bolts, but says that the cost of making staves and putting them on the cars is $1.95 per 1,000. It is assumed that this does not include the material of which the staves are made, though an explicit statement to that effect is not given. In this instance the overhead expense is estimated at twenty cents per 1,000 staves. The overrun of the log measurement at this mill is said to more than make up the waste, though it is not very clear just what that may mean.

Estimates of cost in Arkansas seem to vary considerably, depending, doubtless, on the items which different manufacturers consider in reaching their totals.

One producer of staves says he has no overhead expenses, and no selling expenses, while manufacturers making similar products put these items from sixty to sixty-five cents per 1,000 staves. That is a difference amounting to a great deal on a year's run. Some of the Arkansas estimates follows:

Ash for 1,000 staves	$4.75
Manufacturing	1.80
Overhead	.60
Selling	.05
Total	$7.20
Gum for 1,000 staves	$2.00
Manufacturing	1.85
Overhead	.00
Selling	.00
Total	$3.85
Cottonwood for 1,000 staves	$3.30
Manufacturing	1.80
Overhead and selling	.65
Total	$5.75

It is, of course, understood that staves of the same length may be of different thicknesses, which has something to do with the cost. For example, a cord of cottonwood bolts is estimated to make 2,000 staves, and a cord of ash only 1,400. Five cottonwood staves aggregate 1 15-16 inches in thickness, while five ash staves are 2⅛ inches. Elm staves are thinner than cottonwood. Oak, beech and maple staves are thinner than ash, and, of course, a larger number can be made from a cord of bolts.

Cost in Oklahoma should not differ much from that in Arkansas. Figures from that state, submitted by a maker of slack staves, give his overhead expense at $4.30 per day; but unless the shop's capacity is known, that expense cannot be apportioned per thousand staves nor converted into percentage of cost. This shop figures that its total cost of elm, ash and cottonwood staves per thousand, from stump to car, is about $4.95.—Barrel and Box.

The Hardwood Market

CONDITIONS in the hardwood market during the last few weeks of the year were not regarded any too favorably especially when it is considered that the demand from consumers generally eases off considerably at this period of the year. The new year is as yet too young to afford any real index of what the next few months have in store. The market may be said to have come nearly to a standstill as regards prices generally, the producers having some little accumulation of lumber on hand deciding to hold their stock pending some definite and more favorable developments. The consuming trade, on the other hand, continues its hesitant buying policy. This attitude of the consumer is due to several circumstances. In the first place the inventory season has been going on since the advent of the new year and during that period buyers generally withhold operations owing to the fact, perhaps, that a favorable balance from the end of the year is desired. Another cause of this buying hesitancy is the quiet trade conditions with which many of the consumers are faced at the present time, as trade itself is not any too certain regarding the market for its products. While the various factors in the consuming field both here and across the border are concerned there does not appear to be undue pessimism as to the present conditions, nor is there any disposition to become excited as to the possibilities of a marked increase in trade, for some little time at least. Prominent local shippers are decidedly optimistic regarding the prospect which they are hopeful will open up with the early spring widening of building operations. Amongst wholesale men the view is held that business is little if any quieter than is usual at this time of the year. Then again stock-taking operations have disclosed the fact to many shippers that last year's business was not so unfavorable as many believe. They are thus taking courage and displaying a decidedly optimistic tone regarding the outlook for the present year. Across the border several hardwood dealers report that business last year in their territories was fully up to that of the previous year, while a few declare that it was even better.

Amongst the standard hardwoods, black ash appears at the present time to be most in demand locally, quotations for 1-in. car lots being $40 to $45 and $50 to $55 for 1½-in. and 2-in. Amongst other representative hardwoods, No. 1 common birch maintains its price at $33, first and seconds ranging from $42 to $50, according to length. 1½-in. and 2-in plain white oak is quoted at $70. No. 1 common at $55, other qualities ranging from $70 to $88. Reports from Montreal state that the export trade in birch is quiet. In a review of market conditions since the opening of the new year the Hardwood Record says:—

"No change of notable significance regarding the relative popularity of the various hardwoods has been recorded so far this year, nor is there anything that would particularly indicate a prospective change in their relative standing except regarding the upper grades of most of the more important species. A more favorable demand will necessarily have a lifting effect upon the market for the various grades of the different woods but it is quite likely that the better end of the stock will be most noticeably affected as it is this particular kind of lumber which has felt the recent depression most severely. There have not been any discouraging breaks in the market in general, nor is there anything to indicate any change other than the strengthening of prices all along the line."

Commenting on the demand in various centres, the American Lumberman has the following to say:—

"The hardwood demand is considered seasonable. Trade has fallen off in many sections during the week, but this is only natural in view of the Christmas holiday breaking on the trade. Inventory time is now on at the factories and manufacturers do not expect much in the way of demand until after the new year. A well grounded belief bv southern millmen is that renewed activity will occur after that time, based on the fact that the business world will have greater confidence in the present administration as the result of the currency bill and the fact that the Government will handle the so-called trust proceedings in a fair manner. In West Virginia oak, which has been a heavy mover all the year, has quieted down rapidly. However, this is considered for the moment only. Common chestnut is reported weak in the East and sound wormy is about back where it was before the rise of last spring. Red gum is moving better, and cottonwood in the low grades, meets with good sale. Manufacturers of hardwoods are not worrying, however, for it is conceded that factory consumers have especially light stocks of hardwoods on hand, and will be forced to buy heavily shortly after the completion of their annual inventories. In the northern woods birch and maple lead in demand. Stocks at the northern mills are light, with little likelihood of increasing their size until cold weather and snow permit of logging operations."

Little Economies in the Handle Shop*

Preparing the Blanks, Size of Stock, Layout of Machines, Packing the Pins, Bending of Handles -Method of Correcting Breaks in Fibres

While most of the handle manufacturers cut up log stock with some form of center bolter, it is safe to assert that a bandmill instead of the bolter will result in a considerable saving of stock owing to the difference in thickness of the saws used in the two machines.

But once the stock has been cut to thickness 1 inch, 1¼ inch, 1⅜ inches, etc., it should pass direct to a self-feed ripsaw and be cut into the widths required for orders. For gauge-lathe work, pin, rod and dowel machines, the stuff will of course be cut square, but for pattern lathes the stock may be gotten out wide enough to contain the shape to be made, and here a small economy may sometimes be made by cutting the blanks to a certain taper—wider at one end than at the other.

Cutting Up the Stock

To do this, a special arrangement of the fence is necessary, a pivotal arrangement whereby the work is positively turned at such an angle that the feed mechanism will draw the stock through the machine at the desired angle. But taper work usually costs as much extra as it saves and is therefore done by cutting the stock to the proper taper on the bolter, then the ripsaw need only work off pieces of even thickness.

Stock from 1⅜ inches thick up to 1¾ inches which is being sawn square will yield all manner of thicknesses in the last piece left after all the squares have been cut out. A pretty good way to handle these pieces is to place several trucks near the off-taker from the self-feed ripsaw, something as shown by Fig. 1.

In the layout shown by Fig. 1, the sawyer takes the wide stock from the bench or truck marked "Stock from Bolter" and rips it square as per stock bill. The off-taker slides the uncut stock back to sawyer and places the square pieces on the truck marked "Square Stock." Any edging which will make a strip 7-16 inch wide, or wider, is placed on the truck marked "Wide Edgings."

All the waste stock, and edgings which will not square up 7-16 inch thick, are placed on the truck marked "Waste-Narrow Edgings." This arrangement holds until the wide edging truck is full or until the thickness has been run out according to schedule, then the wide edging truck is moved forward—being purposely pointed in that direction—according to the line of arrows, until the truck is in position to be used in serving the ripsaw again, and the contents of the truck are cut into narrow or thin stock, and narrow edgings, the waste being removed whenever the truck becomes filled therewith.

Sometimes it is necessary to run two or three thicknesses of stock at the same time, whereupon the square stock and thin stock trucks are duplicated for each additional thickness of stock which must be run. It never pays to run more than three thicknesses at the same time, and two pay better than three. In case of the taper stock being run, as described in a preceding paragraph, another car for each thickness of taper stuff will be required, and in extreme cases it will be necessary to surround the off-bearer with eight stock cars instead of the two shown by Fig. 1. But, as stated, this is unusual, and the layout shown by Fig. 1 represents the ordinary order of things around the ripsaw.

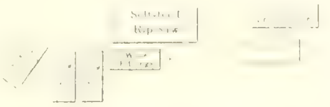


Fig. 1—Layout for working up waste.

Fig 2—One form of reclaimed waste.

The thin stock strips may be worked up into anything which they will make. Tent pins is one way of using up such stock, and these pins, as shown by Fig. 2, are usually made up in three sizes, as follows: 12 by 1 7-16 by ½ inch thick, 16 by 1⅝ by ⅝ inch thick, and 18 by 1¾ by ¾ inch thick. There is also another size, but as it cannot be made of thin stock it will not be cared for in the layout given above, but this fourth pin is 24 inches long, 1¾ inches square, and is pointed from two opposite sides. This pin will now not be considered.

Style and Crating of Pins

Fig. 2 shows a hole through the pin, at A. This is for the purpose of stringing the pins on a wire as will be described later. A corner is cut off at B, and this is done in order that hammering at the end of the pin may not split off the side of the pin where it is weakened by the notch for the rope. Cutting back the corner at B prevents splitting the head into the notch.

---

* By James Francis in Wood Craft

No finishing need be done to these pins or "pegs" as perhaps they should be called, although it might be possible for the manufacturer to market a second or extra quality finished all over. But the common pins go as they come from the saw—rather rough, but plenty good enough to drive into the ground!

Some orders require for shipment that the pegs be crated, in which case hole A, Fig. 2, is omiited. But when the pegs do not have to be crated, then they are strung (200 of them) upon a wire about 12 feet long, and then rolled up as shown by Fig. 3, which is an end view of the roll, the heads of the pins being toward the beholder. The very act of rolling up the long web of pins prevents them from turning sidewise on the wire and enables a firm solid bundle to be made with only one No. 14 wire to hold the pins together. But it proves a-plenty and only needs a tag attached to make the bundle ready for shipment anywhere inside a 40-cent freight limit. Beyond that, crating or boxing will be necessary, as must be done on all shipments into the Dominion. Nothing goes loose there. Every machine or bundle must be crated in tiptop shape before it can cross the line to where the British lion can get his paws upon it!

Wood Bending and Breaking

Another little economy is in the bending of handles for shovels—the long-handled variety, something as shown by Fig. 4. There is required a very short and sharp bend—a double radius, in fact, with a very short tangent between, and about 3 or 4 per cent. of the handles will open a little at a. These handles should not be thrown away. They may be mended so as to be good as new.

As shown by Fig. 4, at A, B and C, the breaks in the fiber of the handles are not enough to weaken the wood to any appreciable extent. It merely makes a bad looking place which the dealer will not accept from the manufacturer. The proper course is to rub the opened places, as shown at B and at C, full of good glue, either cold or hot glue as may be at hand. Then wind a bit of soft wire, either copper or iron, around the glued place, fasten the wire and set the handle aside a few hours, or over night, then remove the wires, and a few rubs with a file, or on a sand-belt will quickly remove every trace of glue and any signs of breakage go with the glue.

When the handles are removed from the bending clamps, the glue and wire may be applied and then the glued ones will not be far behind the balance of the lot when shipping time comes.

Another matter in connection with shovel handles—and long handles especially—is the closing down of the steel straps after they have been riveted to the handle. This matter is shown at F and G, Fig. 4, a section of the handle being represented right through E after the straps have been riveted in place.

The strap presents an appearance about as shown at F, Fig. 4, the edges of the straps sticking almost straight out on a tangent and only slightly curved down to the handle. Sketch G shows the straps after they have been fitted properly to the wood. And it is a very tiresome job to hammer these straps down into even a semblance of the good fit apparent at G, Fig. 4.

A "home-made" method of smoothing down the straps is shown by Fig. 5, and the man who worked out that method purchased from a junk dealer a set of old rolls once used by wagonmakers to roll the felloes and tires even with each other. The rolls are shown at H, and the millman cut off the flat pieces at L. He also added the spur-gears J, one of the rolls being driven, originally, while the other roll was "dead." But gearing them together made both rolls "alive," and the flat places always came along opposite each other.

The handle man also added the spring K, which is a steel ring with a bit of rubber stuffed inside. It gives a little flexibility to the rolls and permits them to spring apart enough to follow the taper in a shovel handle, yet to squeeze tight enough to level down the straps as shown at G, Fig. 4. By inserting the handle in the direction of the arrow, at the instant the rolls were in the position shown, the handle would be drawn through between the rolls just as far as the straps extended by the time that the flat places came opposite each other, and when that happened the rolls lost their grip on the handle which could be removed from the machine through the space between the two flap places. The scheme surely was a whole lot ingenious and it did the work.

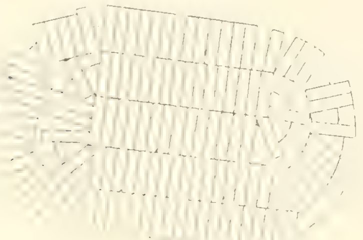


Fig. 3—A bundle of 200 pins.

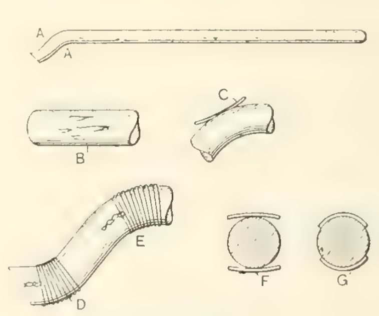


Fig. 4—The mending of fibre breaks after bending.

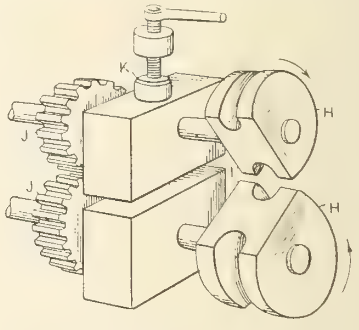


Fig. 5—Device for levelling hammer straps.

By taking a little care to insert the handle with the rolls at exactly the right point as shown by Fig. 5, the rolls would not run beyond the strap before the flat places L come around, therefore the rolls will not mark the wood portion of the handle.

It seems discouraging to put planer knives in nice order and then have a lot of dirty, gritty lumber run through the machine the first thing. It is then that one is reminded of the need for keeping lumber neatly piled and clean.

Machines at times seem to vary in temperament almost like men. There are some which have to be coaxed and petted to get the best results; there are some which do their work smoothly; others will do quantities, but leave it rough.

Important Features in Routing Mill Work

Location of Lumber Shed, Dry Kiln and Machinery — Correlating the Various Operations Required for the Finished Product

THE problems likely to arise along with routing lumber through the mill are so often contingent upon local circumstances that any advice offered along this line must necessarily be of a general character, although we may indicate certain instances to illustrate the points we are trying to make, writes Chas. Cloukey in the Wood-Worker.

One of the principal factors in routing lumber is the location of the lumber shed; another important item is that of the dry kiln; and the other arbitrary feature is the location of the machines in the mill. We may go a step farther and also ask for a logical location for finishing room and packing room.

To begin with, we will give a copy of the bills to be filled to the yard man, and if the lumber he is getting is rough he will bring it to the planer. That is, he will bring it to the planer if it is in the ordinary run of work. But if it is of such a character as to require facing or levelling, it will be cut before facing and planing. Whether it goes to the rip saw or to the cut-off saw first will depend on the character of the pieces to be cut, as well as on the size and condition of the rough lumber. So it will be seen at once that we cannot make an arbitrary routing, even for each class of work, although we may for some classes.

In one mill I know quite a lot of birch stairs are made, and the string boards are not put through the double surfacer at all, but taken directly to the pony planer and planed at least twice on each side, which takes out the kinks and leaves the boards in good condition to work.

This same mill cuts all of its maple treads rough, faces one side, and then puts them through the pony planer. If they have joints, as they nearly always do, they are matched on the shaper, and, after being glued, are again put through the pony planer. If there are many of them they are nosed on one of the sash or door stickers, but if there are but a few and the sash department is rushed, they are done on the shaper. The square cut for the returns is made on the trim saw, and the mitre cut made by hand, unless there is a sufficient number to warrant fixing a gauge to mitre them on the saw.

For softwood sash and door work it is sufficient to put the material through the double surfacer first, then rip it to widths and take it to the swing saw to be cut in lengths. From the swing saw it goes to the sash and door machines. Here it is laid off as may be necessary and the mortising and tenoning is done before the sticking. After the sticking is done, the work goes to the relisher, then to the benches to be assembled and clamped up. After being put together it is taken to the sander and from the sander to the glazing room.

Doors follow the same general route as windows, and after the sander go to the packing room or into stock, as the case may be. However, the routing of veneered doors is a much more difficult problem to take care of, and depends a good deal upon the methods and arrangements of the mill in which the work occurs.

If the mill keeps a supply of core stock made up, then the cores are billed as so many pieces of core stock, and the bill for them goes along with that for the veneers and edge strips. The cores and edges are pushed ahead of the veneer work, and if the veneers have to be made in the mill, their routing will depend considerably upon the machinery used to saw them. If they are sawed on the ordinary scroll band machine it is a wise plan to plane the stock two sides first, then resaw off two veneers, after which the remaining stock is again faced off on both sides. In this way it is possible to get nice, if a regular resaw is used, either circular or band, then the material can come directly from the shed to the resaw and from there to the pony planer.

The cores must be planed after having the edges glued on and then go back to be veneered. Some mills insist upon facing and planing the door stock after it has been veneered, but if this is really necessary it would seem to show a lack somewhere in the preliminary working of the material before the final gluing.

The routing of door panels is another item subject to variable conditions. In case of solid panels the routing will depend somewhat on whether they are made out of single stock or are resawed out of thicker lumber. The general run of solid door panels can be made out of resawed 1½-in. lumber, but the routing will depend upon the condition of the lumber at the time of resawing.

A good many mills buy their panel stock from the west, already cut to sizes, or at any rate approximate sizes, and do their own resawing as they need the stock. This enables them to use any of the stock available for rails or panels, as they may see fit. But the point is that the great bulk of this cut stock is kilned in the west, and after being exposed to the weather for some time the outside of the pieces acquire more or less humidity, and, when resawed, "hump" out so badly as to be useless as panels.

It is the remedy for the above condition that affects the routing in the mill, for if this stock is put in the drykiln or hotbox for a few hours, then resawed and planed while warm, it will be flat and stay that way. So it may be necessary to take this material to the kiln before the resaw, and after the resaw immediately to the planer. If the stock is made from single boards, then it will be brought from the yard to the planer; and whether it goes to the double surfacer or to the panel or pony planer depends upon the condition of the lumber at the start, as regards smoothness.

The routing of veneered panels, again, depends upon the character of the product desired. If the panels are made up of rotary-cut stock entirely, the veneers will be taken to the rip and cut-off saws, and from there to the jointer, if it is necessary to make joints in them. Otherwise they will go from the cutter directly to the glue room. When the panels are glued they should be carefully put on sticks and weighted down, and left until they are dry before working any further.

Panels should be sanded before trimming [illegible] Indeed the trimming is the last machine operation which should be done, on account of possible accident which might happen to them before they are completed otherwise.

Another possible contingency [illegible] panels is that of staining and filling before putting them in the doors or frames. In this case they will have to be taken to the finishing room, then back into the shop to the bench men, to be put into the doors.

There is another element entering into the routing scheme besides that of location and sequence of the various parts, and that might be termed correlation of the various operations required to finish a given product. In other words, it is the best economical management to have each of the parts ready as needed. When it is desired to set up a lot of doors we want the stiles, rails, panels and moldings all finished about the same time. However, we do not want to run a lot of small orders through separately, neither can we hold all the small orders for a very large order. So we again find it necessary to govern our routing and dating according to the necessities of the hour.

The matter of quantity is often a vital one as far as routing is concerned, and may determine whether a certain lot of material will go to the sticker or to the shaper to be molded. We all know that a few pieces may be molded on the shaper with much less expense than on the molder, provided the pattern is one suited to the shaper, and also provided the shaper has the knives already made. If the knives have to be made anyway, then it must be decided which machine will do the work. If the work is not likely to be repeated in quantity, then it would be better to make the shaper knife and route the work that way.

It must be remembered that work routed by way of the shaper is generally to come by way of the jointer and pony planer to bring it to size before molding, while, generally speaking, the work going by way of the molder goes through the double surfaces, then to the rip saw, then the molder.

Another item in connection with moulder and shaper is that of working straight and circular stock to match. It is customary for the molder to make the straight run first and then the shaper match up with the bent or circular work. And one thing should be observed in the sequence of the operations right here, and that is the sizing of the circular members, which should not be done until the straight has come from the sticker for a pattern. Usually when there are but a few straight pieces in conjunction with the circular pieces, the shaper will take care of the whole work of molding. The shaping of very small members in circular or other irregular work is usually done on the edge of a wider piece, and the molding ripped off afterward.

We can see by the foregoing that the subject of routing work through the mill, if treated in detail, would require a specific routing for every class of work, and even then every one of them would be subject to various modifications on account of local conditions. But it is a fact that this is one of the live topics in every individual mill, and is a field for the exercise of much wisdom, as well as watchful "hustleness."

Avoidance of Trouble on the Swing Saw

By W. H. Rohr

IT seems to be a rule in machine woodworking that an old machine always resents a new operator, as a mule does a new driver, and several little difficulties must be conquered before it again settles down to satisfactory routine.

I well remember a shop, in which I was doing all-around machine work, that changed stock-cutters. The new man was a good one and things went pretty well till one day he cut a lot of box lumber that required square ends. As soon as it went to the nailer a kick was registered because it was practically all ⅛-inch out of square on 8 and 10-inch boards.

The cutter and I squared and lined up the back stops so the saw cut square. He went on cutting, but still the box nailer found a large amount of stock out of square. The cutter claimed it was on account of boards slightly bowed and others not having parallel edges.

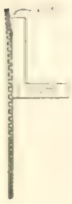


Fig. 1
Test of saw.

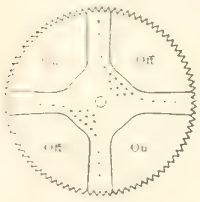


Fig. 2
Result of test.

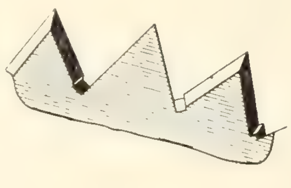


Fig. 3
Troublesome saw teeth.

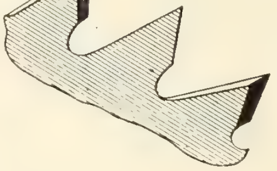


Fig. 4
Teeth advocated for soft woods.

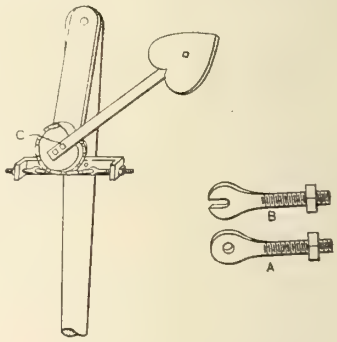


Fig. 5
A neglected counterweight that went wrong.

I went out where he was cutting and tried the square on several pieces he had just cut and found them all out of shape.

"Say, John," said I, "will that saw cut a perfectly straight piece square?"

"Yes," he replied, and then added, "come over and try it."

I selected a straight piece of 10-inch stock about three feet long, laid it in position and slowly pulled the saw through. It showed up perfectly square.

"Well," I said, "you can't get them any better than that; but say!" I added as a sudden thought struck me, "let me pull the saw through that same piece right quick as you do when you are slashing up stock."

I did so and, as I anticipated, the cut was ⅛-inch out of square. He leaned over and gave the frame a shake to test for lateral loose motion, but there was none to speak of. We agreed it wasn't in the frame. Then he asked me if I had ever noticed that when held in the hands in a certain position the saw could be sprung in and out.

"No," I replied. "The engineer who just quit yesterday has been doing the filing and I haven't filed any of the cut-off-saws yet."

We took the saw off the arbor. It was about 13 inches in diameter, 13 gauge, and had about four or five points to the inch.

Using a try-square for a straightedge and testing the saw as in Fig. 1, I found that each side ran alternately off and on, showing it to be in a sort of a twist as in Fig. 2.

Taking it to our makeshift anvil I used a machinist's ball-faced hammer to bring it into shape. On the side where the rim showed "off" I placed a few solid blows between it and the eye as in Fig. 2. Of course, where the rim shows "on" this side it shows "off" on the other side, so it is hammered accordingly. It soon showed up flat all the way around, then it was jointed and filed and gave no more trouble.

On looking at the saw used for rough cutting I found it filed like Fig. 3. I took it to the emerywheel and gummed out a throat like Fig. 4 and filed the front of each tooth with more bevel than the back and gave the teeth a slight lead forward. I find this style of tooth particularly adapted to cutting soft wood, such as was used at this place, red cedar, pine and some cottonwood. For hardwood there should not be so much bevel on the front.

The counterweight is of considerable importance in swingsaws and should be occasionally inspected to see that it is in no danger of giving way and perhaps causing serious accident.

The saw in this shop had its counterweight arranged as in Fig. 5. The bracket holding the ends of chains is fast to the swinging frame, while the weight is pivoted at the stationary pin "C." The eyebolts holding the ends of each chain are like A, but one of them wore entirely through as at B, causing the weight to swing down and the saw frame swing forward while the cutter was at work. Luckily, he happened to have his hands out of the way when it happened, otherwise he might have been badly cut.

The old bolt was replaced with a newly forged one and after these little troubles were settled both man and machine settled down successfully to the regular daily routine service.—Wood Craft.

The Application of Electric Drive to Planers

By W. H. Easton

THE woodworking plant was one of the first to be investigated with a view to bettering conditions as regards transmission and application of power. Early investigations show that the old form of drive from steam or gas engines was poductive of heavy friction losses, expensive attendance charges, etc. Individual motor drive on each machine with central station power supply was the early solution of this problem. Since planing machines in woodworking establishments constitute an appreciable portion of the total load, this type of machine is made the subject of this discussion.

There are several methods of applying electric motors to the operation of planers, planers and matchers, and other similar woodworking tools. The old way of driving this type of machine from one common group consisting of the entire mill equipment, had its many disadvantages in the form of variation in speed of cutting heads, the attendant losses in line shaft and additional belts, etc. Each one of the methods of individually driving these machines obviates these objectionable features and further makes possible local control and adaptability of the tool machines such as timber sizes as well as to lighter machines as the pony planer and the double surfacer. In addition to the mechanical advantages of individually driven planers, there is the question of power consumption in the electrically operated mill. The average woodworking plant, whether it be the small finishing mill, flooring mill or furniture factory, has a low machine load fac-

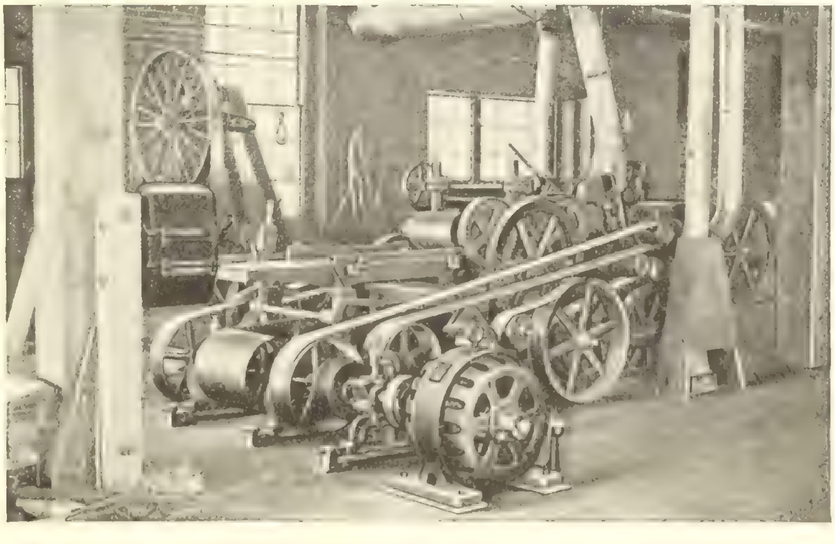


Fig. 1—Westinghouse induction motor driving Berlin No. 94, 15-inch planer and matcher.

The motor is coupled to the counter-shaft by a flexible coupling. The friction load with 4 heads, is 11 H.P.; with 2 heads, 9 H.P., while reducing wet oak 12 inch wide from 1 [illegible] to [illegible] inch at 60 feet per minute, 40 H.P. is required. The 30 H.P. motor is satisfactory for ordinary service.

In [illegible], the percentage of time that all machines are operating simultaneously is small. For this reason the mill that uses group drives is not going to be nearly so economical of operation as that mill which applies a motor to each tool, since in the latter drive energy is consumed only at times of productive operation of the tools, as contrasted to loose pulley, countershaft and belt losses in the former method of drive.

The average size of motor for this type of woodworking machine will range from five to fifty h.p. These sizes will cover small pony planers to heavy machines such as used in finishing mills operated in conjunction with large lumber mills characteristic of the Pacific Coast lumber field. The power requirements of planers depends on speed of cutting tool, rate of feed, condition of cutting edges and the depth of cut taken. Depth of cut and rate of feed have much bearing on the power demand, hence large mills in the West, which usually work machines to their full capacity, use larger motors on tools of similar nature to those used in other lumber fields.

Reference to the accompanying cuts will show typical installations of motor-driven planers which are excellent from the point of motor application.

Fig. 1 illustrates a 30 h.p., 1120 r.p.m. Westinghouse squirrel cage motor, flexibly coupled to the countershaft of a Berlin No. 94, fifteen inch planer and matcher. Thirty horse-power is sufficient for average service but forty horse-power was required when reducing wet oak twelve inches wide for 1⅛ to ¾ in. at sixty feet per minute. The friction load of this machine is eleven horse-power. This type of machine admirably lends itself to individual motor drive since a countershaft of machine and standard alternating current motors have speeds in common. Machines of the heavier type are sometimes equipped with wound rotor motors to provide surplus starting torque, but the squirrel cage motor will usually prove satisfactory.

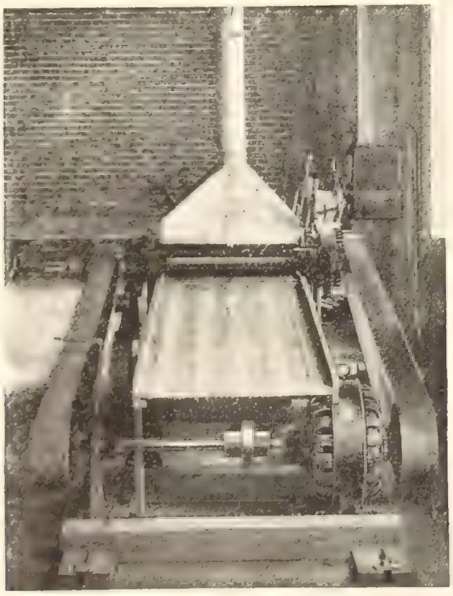


Fig. 2—Westinghouse induction motor driving H. B. Smith 20-inch single surfacer. The motor has a double extension shaft and is built into the countershaft. The complete countershaft is mounted on a sliding base for belt adjustment.

Fig. 2 shows a ten horse-power 1700 r.p.m. Westinghouse motor with double extended shaft which is belted to each end of arbor of an H. B. Smith twenty inch single surfacer, and belt adjustment is provided by sliding the motor and countershaft along a movable base. This drive makes a very compact arrangement, doing away with overhead shafting and belts. Another desirable drive for this type of machine employs two five horse-power motors each belted to one end of surfacer arbor. The motors in this drive are connected in parallel, so arranged to be started from one auto starter.

Fig. 3 shows a five horse-power 1700 r.p.m. Westinghouse motor, belted direct to the arbor of a J. A. Fay & Egan 17 in. pony planer. The most recent advance in the application of motors to planers is to flexibly couple a high-speed induction motor direct to the arbor of the machine, thus doing away with all pulleys and belts. This drive is applicable to single and double surfacers. Some machine builders have developed machines to suit a 3400 r.p.m. motor and have maintained the desired cutting speed by enlarging the diameter of arbor.

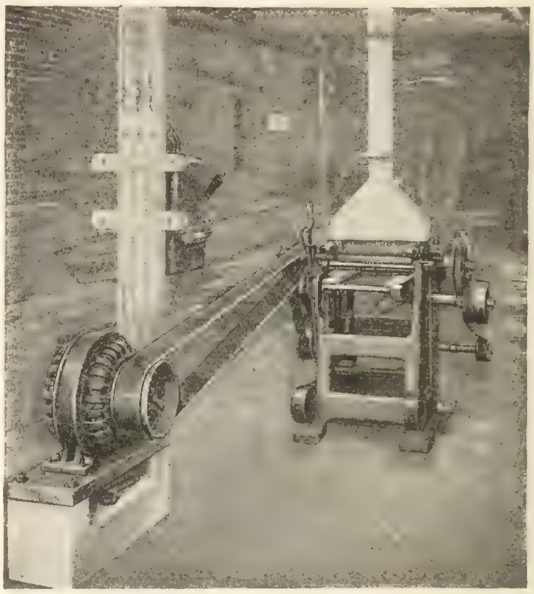


Fig. 3—Westinghouse induction motor belted to J. A. Fay & Egan 17-inch pony planer.

The chief present day advantage of motor drive is made more apparent when it is considered that motors applied in woodworking plants are the result of thorough observation to ascertain the needs in this particular industry.

With the continual improvement in sanding machinery of various kinds there has naturally come more scrutiny and discrimination in the matter of the sandpaper and the sand belting used.

To take lumber out of the dry kiln ahead of time to accommodate a rush order is a poor way to make ends meet, for there is trouble enough with joinery even when the drying is made thorough.

Have a talk with the machinery man before the end-of-the-year shut-down so that you can have the new machines and repairs ready on time and avoid delays.

It is a well-balanced foreman who doesn't look for perfection in his men or fret because it is not there; who sees in them just what is there and has the knack for getting the best out of them just as they are.

Features of Furniture Exhibits at the Berlin-Waterloo Show

THE Employers' Association of Waterloo County under whose auspices the Berlin-Waterloo Furniture Exhibition was held deserve congratulations on the successful outcome of the third annual exhibition of the products of the woodworking industry in the twin cities of Berlin and Waterloo. The exhibition opened on Monday, January 12, in well-appointed show-rooms situated on Queen street, Berlin, and continued during the week with a greater measure of success than has attended any of the preceding shows. It is not surprising that Berlin should hold the premier position in the furniture manufacturing world, it being rightly regarded as the centre of the industry in Ontario, the original furniture factories of Canada, dating back in the fifties, having been located in that centre. Beginning in a small way the business grew to such an extent that today the Berlin and Waterloo furniture factories are looked upon as models which other parts of the country might copy with advantage. The exhibition was well attended during the week, the visitors including many well-known retailers.

We give brief descriptions of the various exhibits both at the show-rooms and at the factories. Both before and during the exhibition the arrangements were carried out with commendable thoroughness by the officers of the Association of whom Mr. Geo. H. Lang is the president, and Mr. J. P. Scully the energetic secretary-treasurer.

D. Hibner Furniture Company, Berlin

The Berlin Furniture Exhibition would scarcely be complete without the interesting exhibit of the D. Hibner Furniture Company, Berlin, whose exhibit was displayed in their fine show-rooms at the factory. The firm carry a special line in sectional book-cases of Colonial and standard designs. The Hibner Company have the sole rights of manufacture in Canada of the Humphrey-Wideman sectional book-case which was patented in Detroit. This book-case is made in solid mahogany finished in fumed or golden oak, an important feature being a metal top in each unit of the book-case which makes it altogether dust proof. A door guide is another appliance not usually found in other types of the sectional book-case. The firm have also adopted the art and craft design which is also made in sections and specially fumed finish. The standard sectional book-case which is made in special sizes in oak mahogany for ladies' use is finished in fumed and golden oak, early English or any color desired. The firm do an immense line in library tables which are supplied in any finish; also extension tables in all colors. Buffets and china cabinets with extension tables and diners to match in cathedral oak were also on view as also were dining-room sets, Sheraton design, inlaid in satin walnut finish. Other features of the display were Sheraton and Colonial sets in plain mahogany. Another cabinet worthy of mention was one finished in satin mahogany which called for much admiration. The firm manufacture the higher grades of goods but at the same time turn out medium-priced furniture as well. In another show-room connected with the factory the firm's exhibit of parlor suites was located. Here some exquisite examples of three-piece suites in solid mahogany were shown in Queen Mary and other styles, the heavy Colonial style also being represented. Another three-piece suite in Circassian walnut and a richly hand engraved chair in solid mahogany were features of the exhibit which won general admiration. Turkish couches and library tables of the Maddox patent were also shown in mahogany and oak as also were ladies' work tables with drawers and a few ladies' writing-desks in solid mahogany. In the firm's Listowel Chair Factory a large line is made of chairs in elm and oak, also library and parlor tables. This year the firm have introduced the sectional book-case and the buffet cabinet as special lines. Doubtless the volume of their trade in these departments will be materially enlarged as a result of the exhibition.

Baetz Bros., Berlin

The exhibit of this well-known firm filled the spacious show-rooms at their factory with an excellent variety of dining-room chairs in oak, birch-mahogany and solid Cuban mahogany, in Colonial, Sheraton, Mission, Dutch and modern designs, bedroom chairs in period mahogany, gum wood and oak fitted with cane seats which latter are a popular feature of high-class furniture at the present time. One of the firm's new lines is bungalow furniture in quartered oak with silver grey finish; another feature being a line of Mission goods in fumed oak finish. Not only do this firm manufacture frames direct from the lumber but they carry on an extensive upholstering trade second to none in the country. The materials used in this respect are leather, cretonnes, tapestries, also plushes and silk coverings. The fine show-rooms were laid out to excellent advantage, the walls being hung with coverings of numerous designs for chairs and suites. A feature worthy of mention was the white enamelled work in bedroom chairs mostly, a parlor-bedroom suite in white enamelled upholstering in shadow cretonne occupying a prominent place in the display which in itself reflects credit upon the furniture industry in the progressive city of Berlin.

Scafe & Company, Berlin

This firm make a specialty of all-stuffed-over furniture after the English model. They specialize in a line of Chesterfields, English living-room and club furniture. The frames which are made by the firm consist mainly of a wood base with steel superstructure. The parts that show are all of solid oak and mahogany. Their main line of course is upholstering, the most expensive designs in French tapestry, leather and silks, being used. The firm's exhibit in the show-rooms was one of the most interesting on view, and their motto is to utilize only the best material procurable.

Anthes Furniture Company, Berlin

The exhibit of the Anthes Furniture Company at their extensive factory was well worthy of a visit by all interested in the manufacture of high-class furniture. The firm displayed dining-room furniture in Chippendale, Adam, Sheraton, Jacobean and Colonial styles, with extension tables to match; also bedroom suites in the various styles. The wood used is principally mahogany and Circassian walnut. This firm, with a record of over forty years to its credit, is known all over the country for the excellence of its products, the aim of the company being to cater for the better-class trade. Amongst the exhibits were two Adam bedroom suites and one dining-room suite of the same style in dull finish, two chairs of the Jacobean period in oak, all of which came in for much admiration by the numerous visitors during the week. Another feature of the chairs was the exquisite figure carving executed by hand, which shows the firm to be amongst the front rank of high-class furniture manufacturers.

Berlin Furniture Company, Berlin

The Berlin Furniture Company, Berlin, whose factory exhibit attracted all comers, certainly have one of the largest exclusive lines of bedroom furniture made in Canada. Amongst the four hundred pieces with which the store-rooms were stocked, we noticed articles with a wide range in price, indicating that this firm, whose business experience extends over nearly thirty years, leaves nothing undone in the effort to cater for all sections of the buying public. The woods especially used are solid mahogany, solid black walnut and quartered oak. This firm claim to be the only one in Canada to revive black walnut, which had been more or less in the background for many years. The difficulty of staining this wood has been overcome by the Berlin Furniture Company finishing the wood in its natural color instead of following the example of other firms that are said to destroy the character of the wood by staining it black. African mahogany is used very largely in the factory as also is walnut and quartered oak, both of which are imported from the United States. The firm make a full line such as dressers, chejoniers, dressing tables, etc., all suites being made complete according to the requirements of the retail trade, the firm's customers being spread all over the country from St. John to British Columbia.

Elmira Interior Woodwork Company, Elmira, Ont.

Amongst the show-rooms' exhibits that of the above company occupied a conspicuous place the exhibit embracing office furniture such as desks, tables, filing devices and wood mantels. A feature worthy of notice was a system desk containing a filing drawer the advantages of which cannot be over-estimated. Filing cabinets in various designs were also shown, together with typewriter desks of which that firm manufacture large quantities. Amongst the new ideas introduced are cane panels on tables and other articles of furniture, this being a feature which has attained much popularity. Some of the designs, particularly the art and craft design was very attractive. Another feature of this firm's exhibit was the electric grate, the wood frame work of which is manufactured by the Elmira Company. The grates shown included two in mahogany finish, one in panels and golden oak and the other in fumed oak finish.

The Lippert Furniture Company, Berlin

One of the finest exhibits that graced the show-rooms was that of the Lippert Furniture Company which attracted unusual attention on the part of all visitors. The display consisted mainly of dining and bed-room chairs, parlor suites, the automatic reclining chair in Cuban mahogany, Southern oak and birch. This firm make a specialty of catering to the wants of the moderate priced dealer, while at the same time turning out high class and particularly well-finished goods. The finishes are fumed oak, golden oak and mahogany, some samples of gold finished furniture being shown to advantage, while not a few exquisite samples of inlaid work were also shown, the upholstery being in tapestries and silks. The company's new feature is the automatic chair, the hemco, the principle of which is that it automatically reclines in any comfortable position without rods or mechanical adjustment. Advantages claimed for the new chair are stylish appearance, comfort and adaptability. The Hubbard Eldridge & Miller Company, Grand Rapids, are the patentees, the sole exclusive rights of manufacture being retained by the Lippert Company. The chair, which is made in oak, is upholstered in leather and adapted for the library. Other features of this exhibit include fancy chairs, rockers, hall racks and setees inlaid in pearl.

Durham Furniture Company, Durham

This firm make a special line of white enamel mahogany, and surface oak, their objective being to strike the happy medium as far as the retailer is concerned. The company's display in the showrooms included cheffoniers in oak and also in surface mahogany, a feature being their china cabinet and sideboard combined, also a buffet. Amongst the firm's specialties are bureaus, stands and sideboards, dressing tables, dining-room and common chairs, in all the popular designs, the company claiming to have one of the best equipped factories in Ontario.

G. H. Hackborn & Company

This firm specializes in upholstered goods, of which the principal are Devonports, couches, the Dourfold bed, upholstered in Peerless leather, mahogany suites and arm chairs with can panelled backs. living-room suites in tapestries, etc., den furniture in leather finished in fumed oak, etc., the whole making a splendid display of the output of this enterprising firm; the heads having the advantage of being both practical men. In upholstering No. 1 hand-buffed leathers are used, also veronas and tapestries, and nothing but the best materials are worked into the finished product.

Woeller, Bolduc & Company, Waterloo

This company's exhibit at the factory consisted of parlor furniture, livingroom furniture, parlor and office tables and library tables. The woods used by the firm are plain and quartered oak and mahogany, the upholstering being done in leather, tapestries, silks, etc. The firm's showroom is fully stocked with samples of furniture of modern design the aim of the company being to produce an article that will meet the needs of the trade; at the same time combining the qualities of modern luxuriousness with those of comparative inexpensiveness.

Waterloo Furniture Company, Limited

With their exhibit judiciously divided between the showrooms and the factory at Waterloo, the Waterloo Furniture Company, Limited, displayed new features insolid mahogany drawing-room suites, light mahogany parlor suites, living-room pieces, etc. The idea of the firm in concentrating in special lines on designs, thereby reducing cost of designs is to enable them to put it on the market at a very popular price. By confining their attention to upholstering and finishing, the firm, which is known far and wide for the excellence of its products, execute beautiful lines in tapestry, leather, silks, etc. A feature of the display at the showrooms was the cane panels in parlor suites in gold finish, which were most attractive.

The George J. Lippert Table Company, Berlin

A valuable addition to the exhibits in the showrooms was the display of this company consisting mainly of pedestal extension tables in quartered oak, library tables and pedestals. The pedestals are made in birch, oak and mahogany, several beautiful specimens of carving work in this line being on view. A feature of the display is the Lippert handy-leaf dining table which affords provision for storing the leaves underneath while not in use. A cleeer device termed the equalizer which holds the leaf permanently without any possibility of its being knocked out of position is the patent of Mr. George J. Lippert. Although the firm specializes in pedestal extension tables at the present time, still they are continually reaching out in various directions, amongst their new lines being a pedestal in solid mahogany for a piano lamp which was the object of much interest by everyone who saw it. This pedestal, richly carved and finished in a dull polish was made in their own factory and so great has been the success in this respect that it is the intention of the firm to make a line of this class of furniture.

Wunder Furniture Company, Berlin

This firm's exhibit was laid out to fine advantage in the show-room of their extensive and up-to-date factory. Their exhibit comprised an extensive line of dining-room chairs in quartered oak and mahogany, parlor suites, fancy pieces, etc., in any finish desired. While not featuring any particular styles the firm specialize in medium to high-class furniture which they manufacture right from the lumber, the mahogany furniture being turned out in dull and polished finishes. A new feature of the Wunder Furniture Company's products is the combined seat and mirror which has become very popular in the trade. It is made in solid mahogany and supplied in any finish. Such of the firm's products as are manufactured in oak are treated in fumed or gold finishings as desired.

Berlin Interior Hardwood Company, Berlin

The exhibit of the Berlin Interior Hardwoods was an interesting one to visitors to the show-rooms. This firm specialize in bank, office and store fittings; also commercial furniture in general. The woods they use are principally quartered oak and mahogany. A popular line of the firm is the execution of church fittings and the supplying of church and lodge furniture in general.

Snyder Bros., Waterloo

The extensive show-room in the factory of Snyder Bros., Waterloo, is replete with a large display of the best specimens of furniture, a main line in connection therewith being the Thoro-bed. This is the only bed in the market which has the wardrobe located in the back. The upholstering is in leather and the general appearance of the bed when closed resembles that of the common davenport for which the firm have the exclusive manufacturing rights for Canada. The firm also carry a large line of Mission furniture, the frames being manufactured on the premises. The wood principally used is mahogany and quartered oak, the finish mostly in demand bein fumed oak. Owing to business developments the factory has had to be extensively enlarged recently. The upholstering is done in imitation and real leather, tapestry, etc., in several different styles. The firm also go in for a large line of Chesterfields, samples of which in tapestry finishings were inspected with interest during the exhibition.

The H. Krug Furniture Company, Berlin

This well-known firm whose exhibit was located in their up-to-date factory had something new to show in the Jacobean furniture made in oak and mahogany. Although the firm specialize in office chairs, for which there is great demand, they maintain a wide reputation for the excellent samples of period furniture which occupies a place in their show-room. Some beautiful pieces of William and Mary period furniture were on view; also a parlod suite of Louis the Fifteenth style in solid mahogany. The Mission furniture in fumed oak finish is another line in which the firm specialize. At ths present time there is an unusual demand for cane panelled furniture and in this respect the firm are showing exceedingly fine samples of furniture in old English, including desks and writing-tables. As a firm of many years standing it is only to be expected that their products will be known far and wide, and the fact that they have carried out extensive contracts in connection with the Chateau Laurier hotel, Ottawa, and the Fort Garry at Winnipeg is sufficient to indicate that the firm are specialists of no mean standing in the matter of luxurious hotel furniture.

Berlin Table Manufacturing Company

A very attractive display was that of the Berlin Table Manufacturing Company showing a full line of quartered oak dining-room extension tables. This firm is specializing in non-dividing pedestal tables, each top being fitted with a self-centering slide, the object of which is automatically to centre the top on the pedestal when extended. The mechanism is of the rack and pinion principle and is invisible being inserted in the slides. Proof of the stability of their slide was shown in a comprehensive way, a table being connected with a motor and run continuously throughout the exhibition. The firm's line included pleasing designs in Colonial, in a variety of finishes, these features contributing to the general distinctiveness of the display.

J. B. Snider, Waterloo

The manufacture of office desks is a special line followed by the J. B. Snider Furniture Factory, Waterloo. The show-room is replete with a wide range of roll top, flat top, typewriter, standing or ledger desks in plain and quartered oak, with golden, fumed oak and early English finishes. Roll and flat top desks with the rotaries, for which we were informed there is a great demand, are also shown, the great convenience and time saving qualities of this device being obvious to anybody acquainted with expeditious methods of filing. The desks are made in full base and sanitary styles and the firm cater as far as possible to the typewriter desk trade. A desk for which there is a good demand by retailers is the ledger desk with accommodation in one pedestal for books, and in the other ior drawers, with cash drawers in the centre. The roll and flat top desk are also made kith file drawers in dull and polish finishes. The firm also supply church, school and other furniture.

H. E. Furniture Company, Berlin

Kitchen cabinets in red and white oak and gum wood formed the principal features of the exhibit at the show-rooms, made by the H. E. Furniture Company, Berlin. The firm make a special line in kitchen cabinets of both high-class and medium grades.

Other Exhibitors

Other exhibitors included the Waterloo Spring Company, the Quality Mattress Company, Waterloo and Berlin; the Excello Motor Washer Company, Berlin; the Berlin Bedding Company and the McKellar Bedding Company, Fort William; Canadian Wood Polishing Company, Onward Manufacturing Company, and the Shurly-Dietrich Company

Machinery and Equipment

New Surface Sander and Bench Jointer

THE Elliot Woodworker Company, Limited, Toronto, manufacturers of woodworking machinery, report very favorably on the volume of business done by this well-known firm at the present time. Their machinery finds a place in the principal workshops of the Dominion, the latest evidence of this being the shipment recently of a machine to the Hudson's Bay Company of Calgary, which, by the way, is the third Elliot machine which this company have in use at the present time.

New Surface Sander

Amongst the machinery recently put on the market by the Elliot Woodworker Company, Limited, pride of place must be given to the new Surface Sander. This machine is specially adapted to hardwood trim or any work of that description, being capable of finishing any piece of wood up to 12 inches in width. This machine, which is illustrated by the accompanying cut, is perfectly balanced, the material resting flat on the bed, thus insuring a perfect finish. Another feature worthy of mention is that the cylinder is mounted on a pair of hanging arms, with an adjustable spring which precludes the possibility of the cylinder becoming clogged by too heavy a cut.

Surface sander manufactured by W. A. Elliot, Toronto.

This sander can be run from the same motor as that which drives the Elliot woodworker, simply by taking off one belt and putting on another.

The Elliot Bench Jointer

A new 6-inch bench jointer, an illustration of which is here given, has been recently put on the market by the Elliot Woodworker Company, the inventor of the machine being Mr. W. A. Elliot, Toronto. This machine has two cutting knives and is built to take a 6-inch cut of 1/8-in. hardwood. The machine can be used for edging or dressing up a small job, bevelling hand rails or casing for bow windows, and it is interesting to know that any kind of power can be utilized to operate this bench jointer. A few of its principal features may be summarized as follows: the throat is narrow which permits of a short piece of wood being jointed off without injury to the operator; the bed is adjustable on both back and front so that it can be readily set for any depth of cut, and the fence also is adjustable which renders it possible to bevel from ninety to forty-five degrees.

6-inch bench jointer manufactured by W. A. Elliot, Toronto.

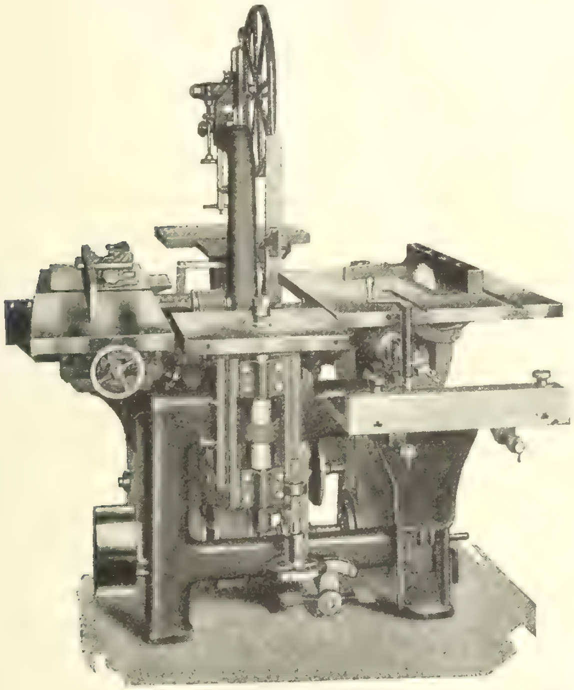
Improvements Introduced

The Elliot Scroll Saw is now being made with a square top instead of a round one which gives more working room to the operator while at the same time improves the appearance of the machine. Another new improvement introduced in Elliot machines is that of a new brush for waxing floors which has been added to the floor sander. The operation is simplicity itself as it is only necessary to remove the sandpaper drum and replace it with the brush drum for waxing and polishing.

It is in no way surprising to find that the Elliott Woodworker Company are having a big sale for their machines in view of the fact that the ease of running, portability and variety of work done has placed this machine in the forefront of up-to-date equipment for the woodworker.

The Universal Woodworker

The Sidney Tool Company of Sidney, Ohio, are makers of the Universal Woodworker, a modern machine which should prove a boon to woodworkers in every line who wish to keep abreast of the times in machinery. The question of economy is an important one and in this respect the makers of the Universal Woodworker, an illustration of which appears herewith, claim to have solved one of the difficulties which in the past has confronted the small factory man, as an equipment of separate machines is frequently considered out of reach of the average small shop. The cost of installing the Universal Woodworker is small in comparison, much less power being required, the floor space occupied being only nominal and the cost of maintenance being probably not more than one-third. This machine comprises a band-saw, a jointer with removable cylinder head to admit of using special heads, sanding drum, etc., combination rip and cut-off saw table arranged for dadoing and other kinds of work, reversible shaper, boring and hollow-chisel mortising machine. It can be adapted to twenty or more different kinds of work. Briefly stated the Universal Woodworker is self-contained, needing only to be placed in a desired position when it is ready for operation without expensive line-shafts, counter-shafts, pulleys and surplus belts. An important feature of the machine is that it can be run with a 5 h.p. motor or gasoline engine. These machines are coming into favor rapidly and doubtless the market will be vastly extended when the merits of the machine are more fully understood.



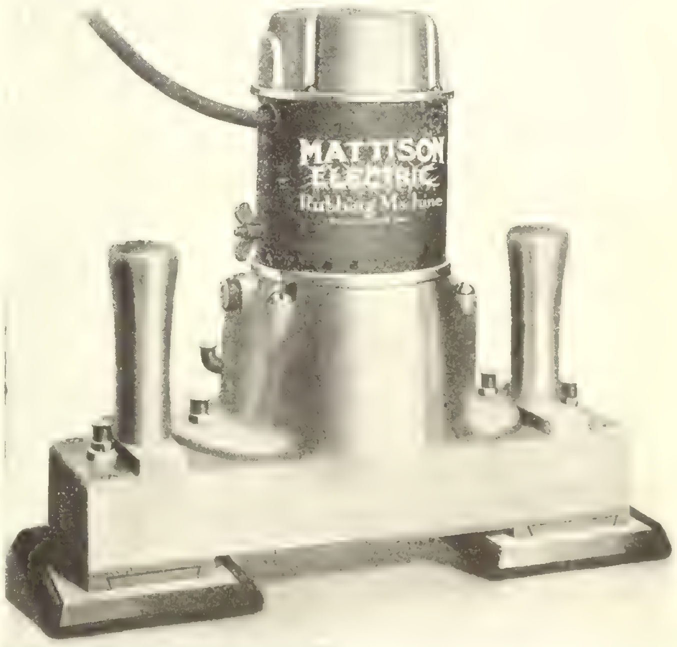
The Universal Woodworker, manufactured by The Sidney Tool Company, Sidney, O.

Methods of Splicing a Sand Belt

The C. H. Driver & Kerr Company, of Racine, Wis., have just completed a machine for cutting and perfecting a tapered or bevelled joint. This machine takes a roll of material, cuts the tapered joints to the length and breadth required, passing it on through and re-rolling on a spool through which a rod can be passed, so that the roll can be hung on brackets for convenience in handling. Whenever a belt is wanted, all there is to do is to unroll to joint, cut off and cement the tapered ends together, which makes a perfect belt with the joint no thicker than any other point on the belt. The ordinary method has been to measure and cut off desired length from a roll of material and then to strip across the two ends, which of course left a joint. There has been great development of late years in belt sand-papering machinery and most woodworking plants are now users of some machinery of this kind. But the development of a sand belt for such machinery has not been what might be called successful, inasmuch as the ordinary method for jointing them left the belt thicker at the joint than anywhere else, which joint is passed over the work with a jerk and is liable to cause imperfections in the work and makes the life of a belt very uncertain. This latest invention of the C. H. Driver & Kerr Company will therefore be hailed as a decided step in advance. An illustration of this machine is given below. It will be noted that it is the roll of material with the tapered joints all made to the length of belt required that is being offered to the trade, not the machinery for making such joints; the plain roll being all that is available for the trade at present.

A New Invention for Rubbing Furniture

For the past three years, the Mattison Machine Works, of Beloit, Wisconsin, who are no doubt better known to our readers as builders of turning machines, belt sanders, and special patented woodworking machinery, have been experimenting with a tool that would relieve furniture makers of the apparent trouble and expense they were experiencing from men rubbing by hand, as well as other mechanical devices that seemed to prove inefficient in doing this work. The result of years of work is illustrated below. The application of electricity itself to such an operation will no doubt be heralded as a new opportunity to save dollars from an operation which heretofore has been considered an expensive burden.



An electrically-operated instrument which has proved successful in saving cost over hand-method of rubbing

The principle of the machine is very simple, yet the mechanism as described by a mechanical expert displays wonderful ingenuity both in workmanship and design. It can be connected to any electric light lamp socket anywhere in the plant and a turn of the switch starts the rubbing operation. There is nothing more for the operator to do but to guide it over the work. Very little pressure is required to apply the proper "bing" that furniture rubbing demands. The machine supplies the "bing" and makes the operator's work comparatively easy and pleasant. Immediately when the current is turned on, the shoes of the instrument begin to move toward and from each other at a rapid rate, making the rubbing movement constant, with practically no interruption. This action of the shoe also keeps the machine in perfect balance and enables the operator to guide it by his little finger. The two handles were provided only for convenience.

The Mattison Electric Rubbing Machine has long passed the experimental stage and is in successful operation in many plants. It may be used for sanding certain classes of work by the use of special sand blocks.

Further information can be obtained from the designers and builders, The Mattison Machine Works, 883 Fifth Street, Beloit, Wisconsin.

The Woodworking Industry at Vancouver

The Coast Manufacturing Company

ONE of the most successful woodworking concerns doing business in Vancouver at the present time is the Coast Manufacturing Company, whose factory is located at 1650 Second Avenue West. Established a little over four years ago, this company possesses a thoroughly well-equipped plant for the manufacture of furniture and fixtures and enjoys an enviable reputation throughout the province for the quality of its output. The firm contracts for all kinds of interior finish, including office desks and tables, mantels, counter and partition work, shelving, side cases, etc., in the manufacture of which hardwood is largely used.

Among the important contracts handled during recent years was the special furniture and finishing for the new quarters of the Vancouver Commercial Club, and the dining room and bar of the Terminal City club, these being among the best equipped clubs in Western Canada. It speaks well for the methods employed at the Coast Manufacturing Company's plant when, despite the prevailing depression in the lumbering and allied industries in British Columbia, the firm has never yet been forced to curtail its output, the present volume of business being quite up to the standard of previous years, while the outlook for the early months of 1914 is described as affording every satisfaction.

The company confines its operations entirely to British Columbia, most of the output being disposed of on the lower mainland of the province, in Vancouver and New Westminster, and also in Victoria, Vancouver Island. The business is under the management of Mr. H. Sanderson, who has the reputation of being one of the most efficient specialists in the woodworking industry in the province.

Arbuthnot & Helmer

The sash and door factory operated by Messrs. Arbuthnot & Helmer, on Sixth Avenue West, is one of the most modern and best equipped plants at the coast. This company has been in existence a little over three years, removing towards the close of 1911 to the present commodious location. The factory is three storeys in height, the first storey being utilized as a glazing and stock room. The second floor is occupied by the machinery room, and the third floor by the finishing department. All classes of interior finish are turned out in the building, which contains 12,500 square feet of space. Special attention is given to the manufacturing of sash, doors and office fittings. The partners in the business, Mr. M. R. Arbuthnot and Mr. R. D. Helmer, are of the opinion that conditions in the sash and door trade will remain quiet in Vancouver until late in the coming spring, when it is anticipated that building construction throughout the city will become much more active than at present.

D. M. Fraser & Company

The woodworking firm of Messrs. D. M. Fraser & Company, 654 Seventh Avenue West, Vancouver, was founded in 1897 by Mr. D. M. Fraser, who is one of the city's pioneers, having come to the coast nearly twenty-five years ago. The company owns an up-to-date plant and manufactures doors, windows, mouldings, and all kinds of mill work and interior finish in soft and hard woods. The trade, which is wholesale and retail, extends throughout the province.

Robertson & McLaughlin

The Vancouver firm of Robertson & McLaughlin, which does a general business in the manufacture of sash, doors, frames and mill work of all descriptions, occupies a roomy establishment at 294 Front street east, where modern machinery equipment is in evidence and employment is given a large number of workmen. The company specializes in bandsawing and turning, and claims to have executed numerous excellent contracts in Vancouver and Victoria, as well as in other centres in the province during the last few years. Since the establishment of the business some four years ago the partners, Mr. W. Robertson and Mr. P. McLaughlin, have made it a rule personally to supervise all work undertaken by the company, and by such characteristic attention to detail have succeeded in attaining their present high standing in the industry.

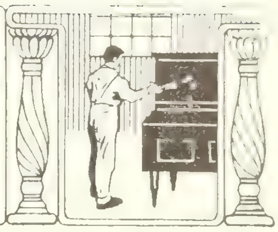
Fairview Manufacturing Company

Established about five years ago, the Fairview Manufacturing Company's plant at 2050 Sixth avenue west, is admirably situated for both local and out-of-town delivery, being located on the Lulu Island inter-urban branch of the B. C. Electric Railway. This firm specializes in the manufacture of different classes of interior woodwork, including stairwork, slab doors and hardwood finish, as well as in mill work of all descriptions. A large supply of art glass and plate and mirror glass is constantly kept in stock, and all machinery in the factory is operated by electricity.

Cornish, Cooper & Company

Cornish, Cooper & Company is one of the oldest firms in Vancouver manufacturing all classes of interior woodwork and specializing in hardwood finish, having been established as long ago as 1888. The company's factory has been located for the past seven years at 245 Dufferin street west, a site which affords excellent shipping facilities owing to the close proximity of the Canadian Pacific, Great Northern and B. C. Electric Railway Companies' tracks. One of the most recent contracts handled by this firm was the entire supply of interior finish for the Birks Block, which is considered the most elaborately fitted up office building in Vancouver. This and other contracts of a similar nature are typical of the class of work handled by the factory, which is equipped with all the latest devices for turning out superior woodwork. There is a regular staff of fifty skilled workmen, and the officers of the company are Mr. B. J. Cornish, Mr. E. Cooper and Mr. A. G. Caldwell. The practical side of the factory's operations is attended to by Mr. Cooper and Mr. Caldwell, the latter being known as an expert in his line. The financial side of the business is in the hands of Mr. Cornish. Commenting on the prevailing dull state of trade recently, Mr. Caldwell stated that his company had a considerable amount of work in prospect. He predicted an improvement in the general situation at the beginning of the new year, and was of the opinion that by next spring the industry would be reestablished on a normal basis.

THE FINISHING ROOM



Finishing Troubles which have their Origin in Other Departments

By C. A. MacKay

EVERY department of the furniture factory has its problems, but there are none greater or more difficult to solve than the problems of the finishing room, because the solution of the problem is not always to be found in the finishing room. Mistakes may occure at any stage of the furniture making process from the lumber yard to the final touches in the cabinet room and never be detected until the goods reach the finishing room. Many of these affect, to a considerable extent, the finishing process and, while a remedy for the present case may be found, the finisher can not solve the problem because the cause of the trouble is not in his department. Some finishers are of the opinion that the finishing department is the place toward which all roads of trouble lead, and in view of the fact that this department not only has its own problems to solve but is also up against the unsolved problems of all the other departments we sometimes think there is a certain amount of justification for the belief.

Not long since, the finisher in a furniture factory found that in certain spots the varnish had heaped up on some of the stock then going through the varnish room. The goods had received a second coat of varnish and he questioned the varnishers as to the cause. They explained that when putting on the second coat they had noticed it in the first coat and thinking the foreman would accuse them of carelessness, they tried to remedy the matter by sanding it down pretty well before putting on the second coat. But the second coat had acted the same as the first. On careful examination the finisher found the varnish had lifted itself from the wood and formed rings, and in the center of each ring was an open pore. He drew the attention of the varnishers to what he had discovered and asked them for an opinion. The consensus of opinion among the varnishers was that the wood had not been properly filled. "That might account for an open pore, or a 'pinhole,' but not for the varnish rolling back and forming a ring around it," answered the foreman.

Trying to Solve the Problem

Here was a problem and the foreman felt that he was up against it. The goods were wanted, but would never pass the way they were. The first thing to be done was to find a remedy for the present trouble, and then search for the cause in order to prevent a recurrence. But it is not easy to find a remedy when one does not know the cause. The goods were to receive one more coat of varnish, but it would be useless to put it on with the goods as they were. If the first and second coats would not adhere to the wood, a third coat was not any more likely to. Nothing could be done, however, until the varnish had a little longer time to dry, so he decided to keep cool in the meantime and do some thinking.

Scarcely had he decided thus in his own mind when the telephone rang and when he answered he found the manager at the other end, wanting to know the date they might expect to be able to ship these very goods. But the foreman could not let him know because he did not yet know what would have to be done to them. He tried to explain, but the manager was not after explanations. He was after a date when the goods would be ready to ship. The foreman was sweating great drops, as the manager grew impatient, and was tempted to name a date in order to get rid of him; but he knew that would be building trouble for the future, and he cast aside the inward suggestion and told him frankly that he could not tell anything about it until he had a chance to do some experimenting.

A Hint of the Trouble

He then went into the staining room and the first thing he noticed was the stainer brushing the end of a mahogany sideboard in an effort to get his waterstain to "take." A glimmering light began to shine into the foreman's brain. Have you had much of this kind of trouble?" he asked the stainer.

"This is the second lot that I have had trouble with. Those No. 761 dressers in the varnish room were pretty bad."

"Do you know what the cause is?" asked the foreman.

"No, I do not, but it must be something in the wood. It is not that way all over, but only in blotches, and then only on those parts that are veneered. The solid parts do not give any trouble."

The foreman's brain was busy. He was putting one and two together. He carefully examined a sideboard that had not yet been stained and found that in places the veneer seemed to be very oily. He was satisfied now that he had found the cause of the trouble in the varnish room. This oil, he reasoned, had prevented the filler from drying properly, consequently it had pulled out of the pores during the process of cleaning off. This accounted for the open pore. The shellac they were using was not very heavy and, consequently, did not neutralize the effect of the oil, with the result that in and around the open pores the varnish would not take. The remedy now was to sand these places down slightly when the varnish was dry enough to permit, and put on a coat of shellac to neutralize the effect of the old, or hold it in check long enough to enable him to get the goods through the factory. With the goods now going through the staining room he would see that a heavier coat of shellac was applied and thus reduce to a minimum the possibility of trouble with them.

While this was a partial remedy, to be applied in case of emergency, it did not solve the problem confronting the finisher and the factory, because it did not fathom and remove the cause of the trouble. That lay in another department over which he had no control. But he determined to trace it back and ascertain the cause, if possible. Going to the veneer room he found that they had run out of parafine wax, with which they had been oiling the cauls, and had substi used paraffine oil. But with the latter the cauls would occasionally stick and the men had been using a double quantity of the oil to make up for the loss of the wax.

Variety of Woods a Problem

Another problem that confronts the foreman finisher is that presented by a variety of woods in one piece of furniture. This is true particularly of oak. Those whose duty it is to match the wood may do their work so well that in the white one would think it was all one piece. But these men did not, and could not, take into account the fact that these various pieces of oak were taken from different trees, and grown in different soils, in different localities and were of different fibers and textures. And the result is, that when the stain strikes the wood the grain shows entirely different from what one would expect when in the white. The color may be all right but owing to some pieces absorbing more stain than others a different effect is produced. And for this the finisher is often accused of having his work "off-color," or condemned because the effect is not uniform.

Sand Paper "Job Lots"

There are a great many things that influence the effect of stain upon wood for which the finisher is held responsible, but over which he has no control. Even the grade of sand paper used in cleaning up the wood influences the depth of color. I once knew a finisher in a shop making a line of oak goods, who was continually in trouble because so many different grades of paper were used to clean up the wood.

The manager of this shop was a bargain hunter and, in consequence, belonged to the "penny wise and pound foolish" type of men. He bought his sand paper in job lots. A travelling salesman had him stuffed with the idea that as a special favor he was putting him on the inside track, where he could buy paper at a big discount off regular price by buying up these lots. And when the paper came, with so many rolls marked No. 0 and others No. 1 and others No. 1½, etc., no one could tell what grade of paper was in the roll until it was opened, and the face examined, because the rolls were all graded wrong. Here is where the manager got stung and here is what caused the trouble. He would place his order for so many rolls of No. 00; so many of No. 0; so many of No. 1, etc. When the paper came and was checked off the number of rolls of the different grades, as marked on the rolls, corresponded with the order. But when the rolls were opened to be used it was found that very little of the paper was No. 00, and that the great majority of the rolls were several grades coarser than they were marked. Had these grades been marked right and bought from a reliable concern the price would have been less than the "bargain" price actually paid; because, as those who buy sand paper know, the finer the paper the more expensive, everything else being equal.

Thus the sanders were compelled to use the paper, no matter what the grade. As long as there was a roll of No. 0 paper around the place the manager would not order more. "No. 0 paper is No. 0 paper," he used to say and no amount of logic could convince him that paper was not necessarily No. 0 paper merely because it was marked such.

Goes Back to the Core Stock

The wavy, undulating appearance of what would otherwise be fine sideboard, table or dresser tops is a serious problem in not a few finishing rooms. This trouble is experienced usually, if not always, with veneered goods. The fact that nothing amiss can be detected until the goods get a coat of varnish does not make it any easier for the finisher. And the further fact that the goods have been put through a scraper which should make a perfectly level surface gives the woodworkers a chance to disclaim all responsibility. Thus the finisher is brought face to face with a problem, the solution of which is beyond his department, and the most he can expect to do will be to find a remedy in the shape of a few additional coats of varnish, unless he can make his influence felt in some other department. This done, he will find that the trouble had its inception in the early stages of the veneering process. He will likely find that the veneer was laid on a core stock that came direct from the planer and was never sanded. That the crossbanding and face veneer were laid at the same time, without anything being done to make smooth and even the surface of the crossbanding. Then the stock was cleaned up before it was thoroughly dry after being veneered and the shrinking which caused the waves took place after it had passed through the scraper.

Defective Machine Work

The finisher is given a batch of mahogany sideboards to finish and he stains them with a water stain. After they are dry he notices in several of the tops a slight raise, anywhere from one-thirty-second to one-quarter inch in width and extending from one end of the top to the other. He has seen things like these before and he knows what is before him. His business now is to find a remedy for the defects before him. He has the raise cut down with a sharp chisel and then stained. But it raises again and is again cut down; and this is repeated until it raises no more. And what a heart-breaking job this patching is. If one only knew that this same thing would never occur again it would be different. But it is likely to be repeated at any time. And why? Because those who are at fault never come in actual contact with the problems arising from the defective work; while the finisher, who is the chief sufferer, has no authority to seek the cause and effect a remedy.

Had the finisher been at the scraper when these tops were going through he would have seen the man in charge lay a number to one side and run them through an extra time. Had he examined the tops to see why this was done he would have seen an indentation in each top running in a straight line and extending from end to end of the top. Had he asked the man in charge why he was putting these tops through again he would have been told it was to bring the whole surface down to a level with these indentations.

Had the finisher been consulted he would have had the machine stopped when the first top with the indentation came through, and removed from the blade a small chip that had become stuck there, and which had caused the depression. Then he would have taken a sponge and drawn some water along the depression and swelled it back again. Perhaps he would have put water on several times, or as often as necessary to bring it back to its normal condition. Then after it was thoroughly dry he would have run it through the scraper again to make a perfect surface.

Finishers are not infallible, but the fact that their own mistakes must be remedied in their own department is an incentive to greater perfection and fewer errors. But the finishing room has its inherent weaknesses and its own problems to solve; and when we add to these the accumulated mistakes of all the other departments and lay them at the feet of the foreman finisher is it any wonder that occasionally one will say: "Truly, the life of a finisher is short and full of trouble."

But gradually the importance of finishers and the finishing room is being recognized, and the day is at hand when they are to receive the credit and consideration due them, but which has seldom, if ever, been granted in the past.—The Furniture Manufacturer and Artisan.

Standardization of Stains in Relation to the Work of the Finishing Room[*]

MANY of the wrangles that arise between the finishing-room and the glue-room in connection with veneer work may be charged up to the staining process, writes C. R. Mason in Wood Craft. Another way to put it would be that they may be charged up to the practice of staining work after it is veneered instead of before it is used.

First Stain the Work

In discussing this subject recently with a prominent veneer and panel manufacturer who has spent practically a lifetime in the business, he gives it as his opinion that if all the staining that was required on woodwork could be done before it is used there would be but little trouble with veneer blistering or coming loose in the finishing-room. As it is, when stock is built up with thin face veneer on it, it goes into the finishing-room where it receives first of all a staining which may be a water stain or acid or oil stain, or it may be a fumigating treatment. In either case, however, it involves the use of moisture, oil and other ingredients which are not by any means beneficial to the glue joint. Often it is the staining itself that causes the loosening up. Perhaps some of the work would loosen up, anyway, but it would be only a small percentage as to what is caused to loosen up by the finishing process.

This is where the wrangle starts. The finisher contends that the gluing is not properly done and that the stuff would go bad anyway, and the glueroom man contends that the finisher should devise some way of staining or treating the work which will not endanger the glue joint of veneering. Then they have it back and forth, with claims and counterclaims, with perhaps some fault on both sides, but always we have before us the fact that around the staining or finishing process there is built up an almost endless lot of wrangles. The result is a percentage of stock spoiled, stock that is spoiled at about the most expensive stage of the game.

The ideal thing to do would be to put all the necessary stain into the wood before it is used. In other words, stain the veneer before it is applied in face work. Then all that would be required in the finishing process would be filling and varnishing, which would not likely endanger the glue joint.

There are many different ways to treat wood to obtain the stain or color desired before using it. There are some of the old-time ways which have been incidentally mentioned in these columns of burying the logs and lumber in the ground with lime and other acid substances to develop stronger coloring or deeper tones in the wood before it is worked up.

There is a modern following of this same idea in which wood is treated with steam and acids to deepen the color and to alter and change it. Mahogany, for example, can be deepened in red tones by a few hours' steaming under pressure. Oak under the same kind of treatment turns a shade darker and the color tones even nicely in it. Certain acids can be added to bring out those greenish gray shades or certain other acids to bring brown shades. For example, what is known as silver gray used to be put into maple with a treatment involving the use of copperas.

Staining of Veneers

There is really no limit to the variety of stains which might be obtained through special treatment of wood before it is used any more than there is a limit to stains which can be applied to wood after it is used. In treating the wood before it is used, there would be the advantage that the staining effect would extend clear through the wood instead of being a surface coat on the outside. In the matter of face veneer, which is usually very thin stock anyway, it should be an easy and comparatively cheap proposition to stain it through and through either by a steaming or dipping process and make the staining thorough. Then drying or redrying after staining would be only a small matter and could be accomplished in the driving out of surplus moisture in staining.

In face veneer treated in this way before it goes into the glueroom there should be a practical elimination of troubles of blistering, and joints opening in the finishing work because there would be no after moistening or staining to do, nothing to do in fact but sand and finish off. It is all a fine theory, but when we go to fit the theory to practice there is trouble from the very start. The first and biggest trouble is in the fact that fashions in stains keep changing all the time and there is such a lack of standardization that no man in one part of the country can stain wood in advance to match some other wood in some other part of the country.

Say, for example, a panel man has an order for a lot of furniture panels of a given kind of wood that are to be finished with a certain stain. These panels must fit in with other woods, solid wood of the same kind, coming from some other source that makes the framework, and of course the staining must match. It simply cannot be done if the panel man is merely furnishing the panels and someone else the woodwork.

Naming of the Finish

At least it cannot be done under the present system of using and interpreting stains. Take oak, for example, quartered oak and that stain known as golden oak. These vary so much from time to time between different users that what golden oak means to one man is an entirely different thing from what it means to another. So much in fact as though it were some entirely different shade. The golden oak shade is simply taken as one example, and the same trouble obtains with practically every shade of stain in use.

The only chance to remedy the [illegible] reduce the practice of staining wood before it is used is to have some clear and specific standardization of stains in woodwork. To do this it would be necessary to eliminate many of the graduated shades of variation and to reduce the whole matter down to a few distinct and specific stains, and let every woodworker be provided with samples of these for his guidance. Then, and then only, can woodwork be stained in advance of using and give anything like a fair degree of satisfaction.

---

[*] By C. R. Mason in Wood Craft

There is one other possible chance to handle this, and that is by the man who furnishes the veneer and panels furnishing the dimension stock and other lumber which goes along with it in making up the piece of furniture so that it will all be stained alike.

This is a chance not likely to be taken, because as a rule the furniture manufacturer obtains his veneer and panels from one source and his lumber from another. Also he has his own notions about what he wants to feature in the way of stains. He wants that part of the work under his own control, and he usually finds the shortest and quickest way to do it is to stain his work after it is put together, or at least after it is made up. This is the way the work is likely to continue for some time, too, yet it does not alter the fact that if the staining of veneer could be done before it goes into the glueroom there would be less trouble with veneered work going wrong.

How to Fill Oak Wood*

THERE are two kinds of fillers for woods, liquid and paste filler. According to the texture or fibrous structure of the wood, either one of these two fillers is used. The open structure of oak demands paste filler, to fill the very open pores, though it is not unusual to add a coat of liquid filler over the paste; this to satisfy the demand of the wood for a filling where the paste cannot well penetrate and fill up. This liquid filling is known as the surfacer, and it will often save a coat of varnish, as where varnish is placed immediately above the paste filling the wood is liable to soak up more or less of the thinners of the varnish, and so impair its life and luster. The paste filler is supposed to fill the wood perfectly, but this is seldom done.

Various substances are employed in the making of a paste filler, but of them all a very fine powdered silica is the best. It fills more perfectly, is more unchangeable under the influences of moisture, etc., and presents a hard, firm foundation for the varnish. Pure silica may be ground and floated to a very fine powder, and yet it retains its natural, needle-like characteristics, which interlace and enter pores and so form the good foundation we have spoken of. The filler is a very simple composition, being merely the pulverized silica, a little varnish and oil, and the thinning turpentine spirits.

The paste is thinned to a thick, creamy consistency with turpentine, and applied with a rather stiff brush of bristles, a half-worn-out paint or varnish brush being just right. It is brushed well into the pores of the wood, and after setting, say, twenty minutes, is rubbed off across the grain of the wood with a piece of burlap, tow or excelsior, being careful to not pull out any of the filling, but rather to press it in the more. When done with this operation, the surface will present a rather rough appearance, owing to the surplus of filler left upon it, but after standing twenty-four hours this may be removed with fine or medium fine sandpaper, sanding with the grain of the wood, until the surface is perfectly smooth. Remember that the smoothing of the surface at this point will mean the saving of time and labor later on.

Now the work is ready for varnish, or for a coat of liquid we call surfacer, which may be a thinned liquid filler. Or sometimes shellac is used, but this is not so desirable, owing to the fact that varnish does not adhere so well to shellac as it does to something like itself. In fact, the best work in varnishing is done by using only the one grade or kind of varnish all through.

To remove filler from corners and similar places where it is difficult to reach, make and use a wooden picker, or get the brushes at store that are made for the purpose and cost but a few cents. The white wood of hickory makes a very nice picker, and the picker may be pointed, flat or curved, as desired. Never fill too much surface at one time, though the area of surface will depend upon temperature of the room.

A good rule is to begin rubbing off when you see the filler begin to deaden or become flat, losing its gloss. Have your cloth ready to rub off with just when it is ready. But be careful not to rub too soon, in which case you will take out of the pores some of the filling. After a little experience all this will be very easy. Where much of such work is done there are men or boys to follow up the men who apply the filler and rub it off. By no means apply so much filler or fill so much space that some of it will harden before you can rub it off, for in that case you will have a lot of hard work getting off the dry surplus. If you do make this blunder once, the lesson will be so severe that it is doubtful if you do it again. Once is usually enough.

The paste filler may be thinned at the rate of one gallon of turpentine to 12 to 14 lbs. of paste, and used as directed. After the surface has been filled and made smooth with sandpaper, apply a good liquid surfacer, which, when dry, may be coated over with whatever kind of varnish the character of the work may require. It is possible to make a polish finish on three coats of varnish, but this demands an unusually good working room and ideal conditions all through. If lucky enough to get the last coat of varnish on without blemish or flaw, and you desire a full luster coat, one that will not require rubbing, you will have it sure, but very few varnishers effect this. A paste filler, for best work, should have from twenty-four to forty-eight hours before sanding, forty-eight hours being best, while the surfacer and succeeding coats should have not less than thirty-six hours between coats.

A correct census of the population of the principal cities of this continent—in fact of the whole world—taken in each decade of the past 50 years would tend to prove that Toronto's growth was probably the most phenomenal of all. In many parts of this Continent the mining and industrial centres have developed with great rapidity. The building of railways and harbours has propagated many a busy town site in a few years, but we must turn to Toronto for an example of what is probably the most remarkable percentage of increase for the past 50 years of any city in the world. At the present rate, Toronto, in ten years will have a population of 1,100,000 people.

---

* By A. Kelly in Veneers.

Announcement

FOR years gone by we enjoyed a loyal patronage of some of the leading furniture manufacturers of Canada not because our prices are right but for the **better reason** that the **quality** of our **stains** are **unit** and give that feeling of confidence and satisfaction that makes permanent patrons and profitable ones. When buying the **Schmidt Quality kind** you always **know** that your products are going out with a finish that cannot be surpassed.

Write for our Stain Booklet and have it on your desk for immediate reference at all times.

Schmidt Co.
Walter K.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

Valuable to Every User of Glue

The Glue Book

What it Contains

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

Ask for our special offer.

Woodworker Publishing Co.
Limited
Nicholls Building, TORONTO

JAMIESON'S LIQUID WAX

—FOR—

Floors, Furniture and Interior Decoration

Contains no beeswax, being made from HARD VEGETABLE WAX. It is therefore far more durable than the ordinary wax.

It is applied with an ordinary varnish brush, and polished when dry, thus saving a great deal of time and labor.

R. C. Jamieson & Co., Ltd.
Established 1858
Montreal Vancouver
Owning and operating P. D. Dods & Co., Limited
OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

Veneers and Panels

Suggesting Profitable By-Products

UTILIZING waste veneers is a proposition which has often been up for discussion. Great strides, however, have been made of late in this respect, and the prevailing policy of nearly every veneer or panel manufacturer of importance is to convert all possible waste into commercial by-products of one sort or another.

In this respect, however, conditions vary to such an extent in plants that it is not always possible to go in for this line of business. The lack of floor space or facilities of manufacture may contribute to the lack of interest taken by the heads of some of the concerns in matters of this kind.

Nevertheless, the manufacture of commercial articles out of the waste veneers, such as having streaks of sap or other defects of a similar nature, or the offal sometimes resulting from cutting flitch or resawn veneer to dimension sizes, has progressed more rapidly than many may be aware of. Some of the more progressive concerns have taken this question quite seriously and have made notable progress in this direction. What has been achieved by some may be of value to others, who still cling to the old methods of destroying all veneer waste. Others may think that they will be forced to expend quite a sum in additional machinery, if they tried to convert their waste into articles that produce the long green.

To prove that such a contention is entirely wrong, and that a whole array of commercial articles can be manufactured, in which scraps of veneer may be used in thickness from ⅛, 3-16 and ¼-in., in width from ½-in. up, and in length from 5-in. up, I will illustrate a few of the articles which can very easily be made without the use of any special or additional expensive machinery excepting a good combination table saw, with the exception of Fig. 3, which would require a band or jog saw, if made according to illustration.

No. 1 is a porch gate and can be made of any kind of waste veneers in thickness of 3-16 to ½-in., in widths of 1 to 1½-in. and in lengths of about 30-in. An article of this kind usually retails from $2.50 to $3.

Fig. 2 is a hat or coat rack, usually made of waste 3-16 to ¼-in. thick, 1 to 1¾-in. wide, and pieces as short as 8 and 10-in. may be used. This usually sells from 25c up.

Fig. 3 is a dining room cabinet or shelf, and may be made of waste ¼-in. thick or from defective glued-up stock which cannot be used up otherwise to advantage. These shelves can be made in any length from 18-in. up for the bottom shelf and from 10-in. up for the upper or top one. This is an attractive article and is usually stained in mission or some other dark color.

Fig. 4 is a wall pocket, which can be made of waste in thicknesses of ⅛-in. up, and any desired size for which material may be on hand or work up to best advantage.

Fig. 5 is a wall motto, made of any ⅛-in. or thicker veneer, and in any size to suit wording. It is usually stained dark, with red letters.

Fig. 6 shows a wall motto made of ⅛-in. veneer, the background being about 4 x 8-in., with a frame of same material, ⅛-in. thick and ½-in. wide, stained any dark color, with red or white letters.

Fig. 7 shows a letter rack made entirely of narrow edgings of veneer, from ½ to 1-in. wide. Made entirely of ⅛-in. veneers, this article will invariably prove a necessity in every home.

Fig. 8 is a magazine-holder, made of any ⅛-in. waste of convenient size, with ¼-in. cleats on each end, over which the front or crosswise strips of ⅛-in. veneer are placed. This also makes a very suitable article.

Fig. 9 is a match-holder, into which probably a good many otherwise worthless small panels or waste veneers can be converted.

From the foregoing it can be plainly seen that there really is no limit to the various articles which can be

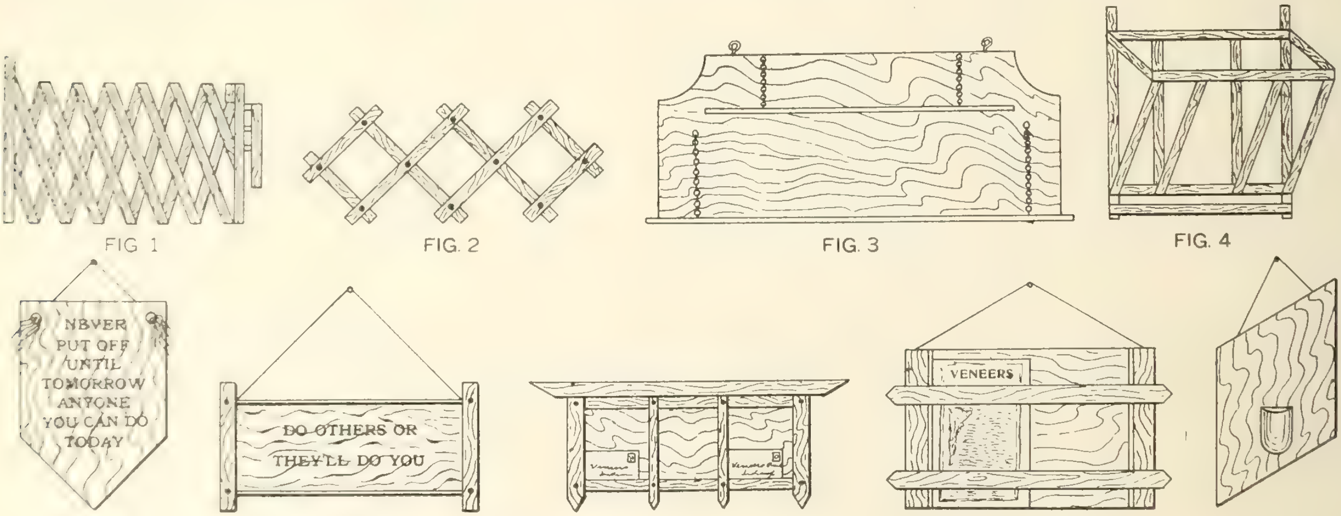


FIG 1 FIG. 2 FIG. 3 FIG. 4
FIG 5 FIG. 6 FIG. 7 FIG. 8 FIG. 9
NEVER PUT OFF UNTIL TOMORROW ANYONE YOU CAN DO TODAY
DO OTHERS OR THEY'LL DO YOU
VENEERS

Suggestions for Utilizing Veneer and Panel Factory Waste.

manufactured in any plant which possesses a combination table saw, and surely there is no plant which does not possess one or more of these machines. Considering it from all points, there practically is no excuse for wasting any piece of veneer, for somehow or somewhere there can always be found a use for every piece of waste.

It may be well to mention that one plant which had quite an amount of waste of this kind has adopted a policy of this sort and has found that it pays handsomely to work up every piece of waste.—Richard Neubecker in Veneers.

Some Aspects of the Veneer Industry

SEVERAL interesting papers dealing with various phases of the veneer industry were read before the National Veneer and Panel Manufacturers Association at its Eighth Annual Convention in Chicago last month.

Addressing the convention on the variation in prices, Mr. Jarrell, the President, said in part:

Concerning Prices

"It is a well known fact that quite a good many manufacturers are selling veneer and panels without reference to cost of manufacture, and the great variation in prices is appalling. It is gratifying to note, however, the number of such manufacturers is decreasing, and will continue to decrease just to the extent that our association can secure their co-operation. There are times when the demand for goods proves to be exceptionally heavy, and without any apparent cause inquiries dwindle and almost cease. None of us like to have our books free from orders, and when times of depression arrive, and we find it will probably be necessary for the output to be reduced somewhat, we feel an almost uncontrollable desire to reduce prices, even down to cost of production, rather than curtail, or close down our plants for a time. One selfish, thoughtless manufacturer with an established reputation, can rob innocent brother competitors of trade they have worked long and hard to establish by quoting ruinous prices just in order to keep his mill going six full days in the week. How much better for the industry would it be for the output to be regulated by the demand rather than for it to be continued at the highest notch, and the prices regulated by the output.

The Russian Veneer Industry

Mr. Henrik Cronstrom, who has been studying the veneer industry in the United States, contributed a paper detailing the methods of veneer manufacture in Russia. Beginning with the handling of the logs he said: "The logs are cut from December to March and transported to the factory in winter by rail, but in summer often by water, being made to float along with logs coming from lighter trees, to keep them from sinking. The logs are carefully stored away at the factories and are kept in water-basins during the warmer season. This prevents splitting and change in color, and the logs are therefore, when work on them begins, quite as fresh as if they had just been cut.

"Immediately before cutting the logs are steamed under pressure, for about six hours. This steaming must be done with much care. The pressure rises slowly from 0 to 15 pounds per square inch. All condensation must be drained from the boilers so the logs do not lie in the water. This is very important. After the steaming the logs are carried as quickly as possible to the veneer-lathe.

"Then follows the most important process after cutting: Glue spreading and drying. This is somewhat different in different factories. In most of them the veneer is carried direct from the veneer-lathe to the glue spreaders. Some factories, however, will first pass the veneer through a so-called wringer, to squeeze out a part of the water through the pressure. This tends to produce considerably the time of the actual drying process. This operation will often remove from twenty-five per cent. to forty per cent. water, hence it is easy to see that the expense of the drying is reduced to quite an extent. Some factories now use even a hot air drying machine for this purpose. The main thing is, however, that this pre-drying—where it is done—is never a complete drying, but has for its purpose only a somewhat lower presence of water in the veneer; hence, practically speaking, it is still in a wet condition when it reaches the glue-rollers.

"When the wet veneer goes through the glue rollers it imbibes not only the glue itself, but at the same time the materials that make it waterproof. The glue covered veneer comes then into the so-called glue press, where it is submitted to a high pressure between steam heated plates. In this press, where the veneer is held a longer or shorter time, depending upon its thickness, the largest part of the moisture which is in the logs is removed. From this press the veneer is introduced into the so-called dry press, where it dries off and cools off quite thoroughly.

"When a veneer for export is to be produced, without special designation of its purpose, the only thing still to do is to cut the veneer into the desired sizes, which is done in a so-called clipper for sizing, and to carry it through a scraper, whereupon it is ready for export.

"With several factories, however, a part of the veneer is treated somewhat further, by sawing it into ready plates for tea boxes, chocolate, ash trays, etc. In these cases the appearance of the veneer is often changed by letting it go through a coloring machine, imitation machine, smoothing machine, etc."

Proposed Exposition of Woods

The need for a practical method of demonstrating to the consumer the qualities of wood was discussed by the Secretary, Mr. Defebaugh, who said regarding this subject:

"If anything has been needed in the woodworking lines in the past it has been a practical method of demonstrating to the consumer the good qualities of wood, and the Forest Products Exposition which is to be held in Chicago April 30 to May 9, and in New York from May 20 to May 30, would seem to be just the thing we are looking for. This project is backed by the National Lumber Manufacturers' Association, and it seems to me that the veneer manufacturers ought to do the same thing as the other organizations and put on an exhibit, and have some intelligent man there to show the possibilities of gum, and other veneers for various purposes, such as interior finish. I believe this would be the means of increasing your sales materially, as it would demonstrate more clearly to the consumer, the architect, and those who influence the purchase of woods, the desirability of buying better woods to go into a dining room, or living room. I hope this association will appoint a committee to look into the possibility of participating in this exposition of woods.

Utilization of Waste

Mr. Stanley L. Wolfe, of the United States Forest Service, Washington, speaking on the "Utilization of

Waste in Veneer and Panel Factories," said in part:

"The United States Forest Service primarily took up timber testing, and later it was thought practicable to establish an office of industrial investigations, and this department has taken up the different wood-using industries by states. Since those publications have been almost completed our policy has changed, and we have determined to take up the individual industries in a more intensive way. For this purpose men are assigned to one single industry, the idea being to train the men to be proficient in one line so that they may attain knowledge which you might call expert. I was assigned in July last year to the study of veneer.

"It is not my purpose in this talk to tell the manufacturers of veneer, who have been in the business 20 or 30 years, the intricate problems of the veneer industry; in fact, I have not had enough practical experience along that line. We have in the office of industrial investigation a great deal of theoretical knowledge. It is my purpose to bring forth a few suggestions and tell you what I try to do. Of course, a man in the veneer business is hampered by his business cares, so that he cannot ordinarily look over the horizon of his business. I have been trying to get information which might help your association.

"Waste in any manufacturing plant may be classed under one of two heads. The first of these can be called the waste due to lack of efficiency, and second, the waste of raw material. Under the first class are included losses due to faulty administration and supervision, inefficient machinery, poor arrangement of machinery on the shop floor necessitating excessive handling, or any other factors which tend to retard the smooth and uninterrupted operation of the mill. The second class of waste is that material which is discarded, culled or removed by machinery in the process of the manufacture of a given product."

The speaker went on to state that in connection with the rotary process he found it hard to come to any definite conclusions in his investigation, but that the sawing and slicing methods offer simpler conditions. His investigations had convinced him that the greatest waste usually accompanied a sawing operation; that he estimated the waste in rotary work to be from 20 to 50 per cent., while the waste in sawing was from 40 to 50 per cent.

A Valuable New Hardwood

The increasing scarcity of hardwood has called attention to the Junco tree as a possible substitute for some of the more popular woods, and the result is a surprise to those who considered the wood had no commercial value. The Junco is restricted to a single valley, that of the Rio Grande in Mexico and Texas, and therefore is little known to the outside world. The minute leaves are scale-like, the flowers very small, and the fruit a tiny berry. Except as fuel, it has not been put to any use. Of late, however, the scarcity of hardwood has called attention to the Junco tree as a possible substitute.

The wood sinks in water. In color it ranges from brown to black. It receives a high and beautiful polish, fitting it to take the place of such expensive woods as ebony and rosewood for small cabinet work. The trunks are so short and crooked that only small pieces of timber can be obtained from them. Few trunks exceed seven feet in length and eight inches in diameter. The wood is said to be admirably suited for the keys of musical instruments, jewel boxes and other bureau cabinets, chess men, checkers, paper knives, knobs and other small turnery, inlaid work, and indeed for almost all purposes for which costly foreign woods, in small pieces, are now used.

The Manufacture of Veneers at the Plant of the Dominion Mahogany & Veneer Company, Limited

THE Dominion Mahogany and Veneer Company, Limited, of Montreal West, enjoys the distinction of being the only firm in this line manufacturing mahogany veneers in addition to other varieties. This is a new industry whose operations are conducted upon quite an extensive scale. The president of this firm is Senator N. Curry and the managing director Mr. Geo. Kersley, who was appointed recently to succeed Mr. Arthur Rushforth, who resigned on account of his extensive interests in England.

The company's plant, in which some seventy men are employed, is one of the finest of its kind on the continent. In construction it is substantial throughout and the equipment is excellent. In regard to shipping facilities the factory is served by both the Grand Trunk and the Canadian Pacific Railway.

Mahogany, Circassian walnut, English brown oak sawed and sliced, rotary cut birch, maple, elm and beech for drawer bottoms, panels and centres for furniture manufacturers, are the chief woods used. Some of the veneers are magnificent in their figuring, and are utilized for the highest class of work.

Although the company has been manufacturing only since November, 1912, the factory has been running to its capacity and the output is booked up for the next four months. The company's customers extend from the Atlantic to the Pacific.

The company have timber limits in the province of Quebec for birch and maple, and manufacture these logs into veneers for drawer bottoms; panel stock and centres for the furniture trade; and pin block stock for the piano trade. The logs are cut into thickness of veneer from 1-24 to ¼ of an inch, both sawed and sliced. All mahogany logs are quartered, and all lumber is piled on sticks. The refuse is taken by the blower system to the boiler and burned.

The logs, on arrival, are placed in the yard, where they are cut into lengths by a drag-saw lifted by der-

Band mill showing log ready for cutting.

rick to the mill room, and then moved on a truck, which runs on rails to the saw carriage. This takes the logs to the big band sawmill, where they are cut into whatever thickness of plank is desired. That dust drops down and is carried away by suction. The boards are conveyed on rollers and then by means of conveyors to the edgers. they are fed through these, and after having the edges removed, go to the trimming saw. Afterwards, still by means of rollers, they are sent to a sorting table in the yard below, where they are sorted. The saws in the edgers are movable and thus adjustable to the sizes required.

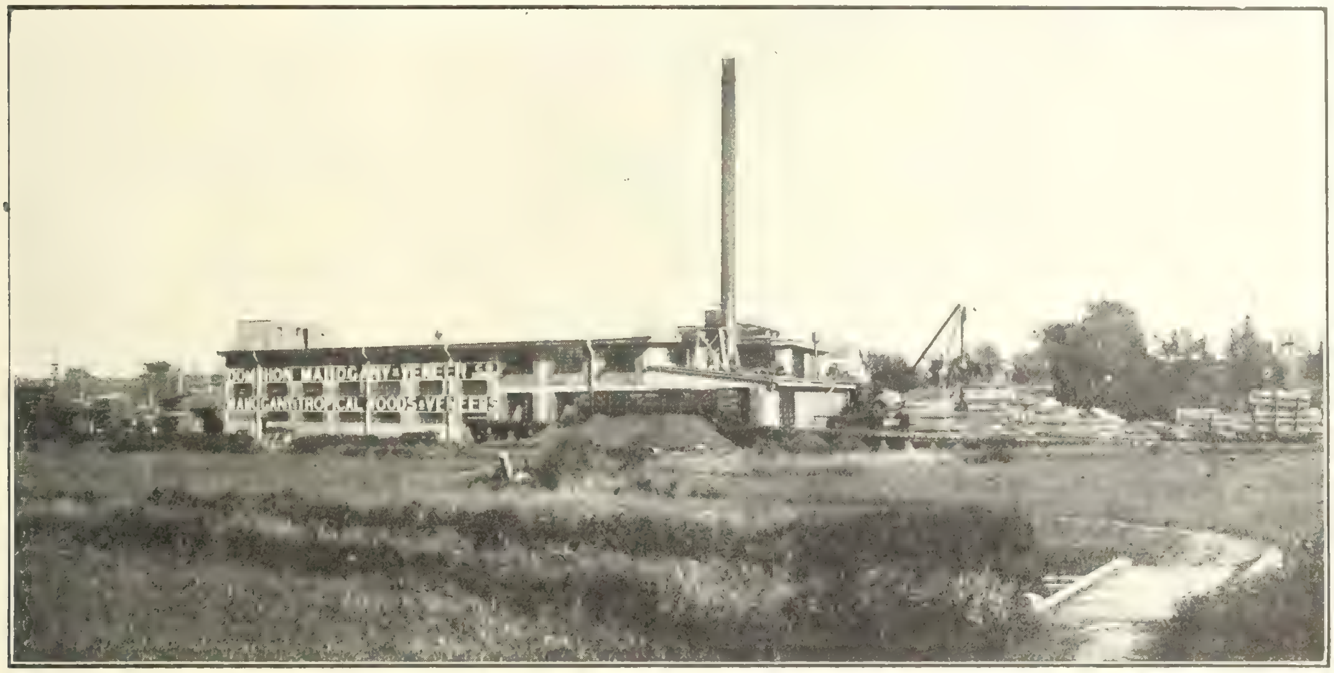
The logs which are required for veneers come into the mill by the same means, and are cut by the same process. The flitches are then conveyed to the sawmill, where they are manufactured into the different thicknesses of veneer and are afterwards rack-dried.

On the ground floor logs are brought in the round from the yard and put into a tank, where they are boiled for twenty-four hours. The logs are then placed in a rotary lathe and the veneers made by the rotary process. The veneers are taken to the slipper and cut to size, thence into the automatic dryer and after being crated are ready for shipment.

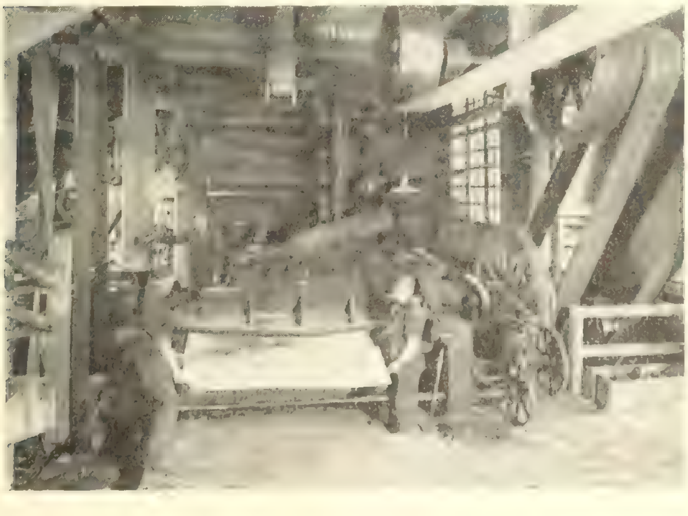
Mahogany after being steamed, is taken to a slicer, where it is cut into veneer. The machine is very substantially built, the logs being held by dogs, and the knife automatically brought into contact with the lumber. The veneers then go to the dryer, which consists of a series of layers made of chain, and the veneer is fed through this until it comes out at the other end. meanwhile receiving treatment by hot air fanned into the machine. The filing room on the top floor is well equipped with modern machinery.

There are two sample rooms, where over one million feet of veneer are in stock. Each log is carefully tagged and tallied. From every log three samples are furnished to the traveller, each sample being hinged into lengths, and these are so arranged as to fold into trunks.

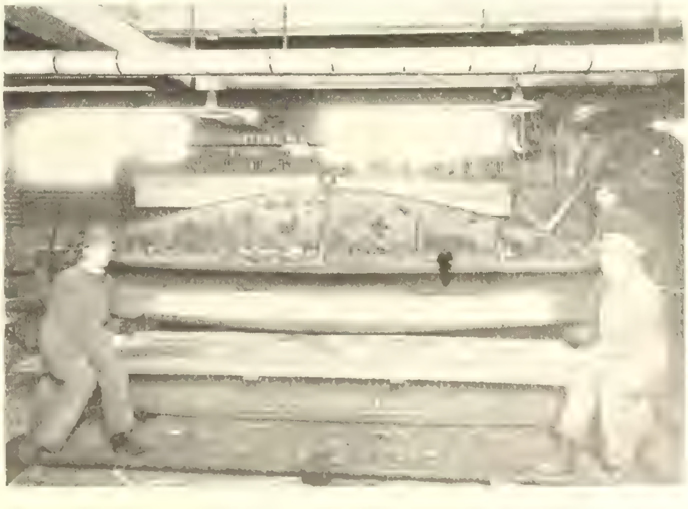
The works are fitted with a special filtration system for drinking water and also a luncheon room. There is a telephone system right through the building.


DOMINION MAHOGANY & VENEER CO.
MAHOGANY TROPICAL WOODS & VENEERS

Dominion Mahogany and Veneer Company's plant at Montreal West.



Rotary lathe cutting drawer bottom stock.



Veneer slicer machine.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB Reg U.S. Pat Off

Hoffman Bros. Co.

HB Reg U.S. Pat Off

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods
ANY THICKNESS,
1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—*SPECIALTY*—

HB Reg U.S. Pat Off **Indiana Quartered Oak** HB Reg U.S. Pat Off

Sawed Quartered Oak Veneers

WHITE OR RED——HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1/16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum .
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Dimension Oak Stock

We have an excellent supply of highly figured sliced quartered oak and are prepared to match, joint and tape it for you. This is getting to be quite a feature in our business and we will take pleasure in quoting you prices.

PLAIN AND FIGURED ROTARY-CUT VENEERS

High-grade stock in all woods promptly furnished. Forty-four years of successful manufacturing.

Adams & Raymond Veneer Company

Established 1869 INDIANAPOLIS, IND.

VENEER MANUFACTURERS COMPANY.

CHICAGO. ILLINOIS.

IF the best logs — the best equipment—and a conscientious desire to satisfy means anything to you in buying veneers, write us to-day for

Circassian Mahogany Quartered Oak

or other fancy woods.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for :

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,

Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality.

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana White Oak Timber and make the best grade of quartered oak Veneers put on the market.

Write Us for Prices

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

We have here in Chicago the most modern and best equipped Veneer and Band Saw Mill in America

The first order will make you our permanent customer—Because:—

We manufacture right, so—
Our product is right.
We carry a large stock, so—
Our shipments are right.
We have a labor saving mill, so—
Our prices are right.

We Specialize in Oak and Mahogany Veneers, sawed and sliced. Also Quartered Oak and Mahogany Lumber

Let us know your wants

Fred W. Black Lumber Co.

2245 So. Crawford Ave., CHICAGO, U.S.A.

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for
Poplar and Red Gum
Veneers and Crossbanding

H. C. HOSSAFOUS

MANUFACTURER OF

Sliced Quartered White Oak Veneer

Genuine Indiana and Ohio white oak logs, cut into flitches at our own plant, **perfectly smooth cut and dried flat** and without gloss.

We can help you solve your Sliced Oak Problems
Let us quote you on your Reuqirements

DAYTON, OHIO

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

MAHOGANY LUMBER—VENEERS—Foreign and Domestic Fancy Woods—Panel Stock

Veneers in all thicknesses from 1/28″ to 1/4″

We make a specialty of 1/20 Mahogany Veneers both sliced cut and sawed. Write us.

HUDDLESTON-MARSH LUMBER CO., 2260 Lumber Street CHICAGO, ILL.

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker". They are progressive firms the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend time and money to get in touch with you. He deserves it—if his stock and prices are right.

FURNITURE FINISHING

Water-Proof Shellac

A pure Shellac, cut four pounds to the gallon. Made absolutely water-proof without altering the working drying and sanding. Give it a comparative test with the ordinary Shellac as to its being water-proof and you will readily see its merits.

The ideal undercoating for Mahogany, Mission and Business Furniture.

Five gallon Sample sent at BARREL Price.

New Fuming Process

The Fuming of Oak is easily accomplished by the use of this Pigment Stain. The resulting color is superior to and more uniform than the genuine fumed obtained in the fuming chamber and will not fade.

Any one can get results.

Maple-Lac

Keeps White Maple Furniture White. It preserves the natural whiteness of the wood and prevents it from turning yellow with age. Give it a comparative test with Shellacs and other Coaters and note difference.

Five gallon Sample sent at BARREL Price.

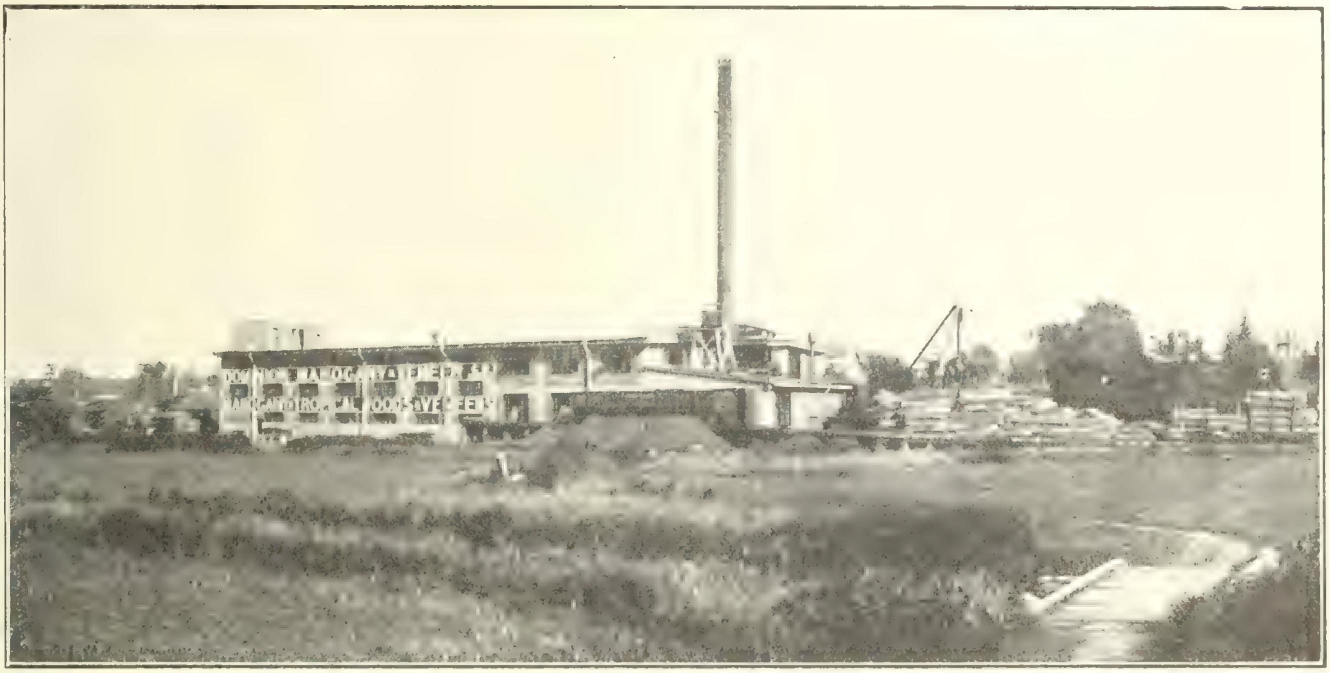
ADVANCE PAINT COMPANY INDIANAPOLIS, Ind.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

The Dominion Mahogany & Veneer Co.
Limited



The Pioneer Mahogany Mill of Canada

LUMBER— African, Mexican, Cuban Mahogany, English Oak, Teak, Black Bean and Vermillion.

VENEERS—Sawed, African and Mexican and Cuban Mahogany, Maple, English Oak, American Quartered and Plain Oak 1/20"-1/4".
Sliced, African and Mexican Mahogany, Circassian Walnut, Italian Walnut, Birch, etc. 1/24", 1/20", 1/16".

ROTARY CUT— Birch, Maple, Ash, Gum, Poplar 1/24"-1/4".
Drawer Bottoms and Pin Block Veneers and Door Stock.

MADE IN CANADA

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

Dominion Mahogany & Veneer Co., Limited
MONTREAL WEST, QUE.

Trade Happenings and Opportunities

Woodworking News from Coast to Coast

Eastern Canada

The firm of Rolland Frere, furniture manufacturers, Montreal, has been dissolved.

Decbul Tools, Limited, of Montreal, which was burned out recently, was partially insured.

The firm of Davis & Doty contemplate erecting a planing mill 45 x 100 ft. at Oakville, Ont.

The firm of Edgar Caron & Company, sash and door factory, Montreal, has been registered.

The firm of Caron & Raymond, who operated a sash and door factory at Montreal, have dissolved.

Messrs. MacArthur Hee Company, Limited, woodworkers, of Stellarton, N.S., have sold out.

The Dominion Organ & Piano Company, Bowmanville, report a very successful year's business during 1913.

The Montreal Wood Mosaic Flooring Company, Limited, and the firm of P. Portugais & Company, woodturners, Quebec, have been practically burned out.

The British-American Paper Box Company, Montreal, and Messrs. J. A. Lefils & Frere, Jos. A. Lefils and Michael Lefils, broom manufacturers, have been registered.

Messrs. A. & M. L. Dawson, Newport, Que., have registered as lumber manufacturers under the title of Dawson & Brothers.

The Papineauville Lumber Company contemplate the erection of a mill at Papineauville, Que., for the manufacture of hardwood veneers for cooperage and cheese boxes.

Under the winding up of the Wotton Chair and Toy Manufacture, Limited, Wotton, P.Q., the liquidators are selling the property, including a sawmill and machinery, by tender.

The ratepayers of Chatham, Ont., have defeated a bylaw for bonusing, to the extent of $12,000, the Saginaw Match Company, Saginaw, Mich., which proposed to erect a factory at Chatham, Ont.

Joseph Boule, an employee of Booth's Lumber Mills, Ottawa, met with a terrible death on December 30th by being drawn on to the knives of the pulp mixer.

Work will commence shortly on the erection of a planing mill for the Goderich Milling & Lumber Company, at Goderich, Ont. Mr. J. Ades Fowler is the architect.

It is reported that a piano factory will shortly be started in Sackville, N.B., by Mr. John Guy, who is said to have carried on business for some time at Moncton.

The Preston Planing Mills, a new two-storey brick structure, was finished and placed in commission during last year and has been turning out a variety of products in its line.

A new planing mill is on Port Arthur's list of prospects. The firm behind the enterprise is the Bertrand-Lockhart Lumber Company, Limited, which is now in process of organization.

The general contractors for the new Dominion Bank which is now being erected at the corner of King and Yonge streets, Toronto, are busy with the interior work and are making good progress with floors, partitions, etc.

A by-law has been submitted to the ratepayers for the purpose of granting Messrs. Walker & Clegg a bonus of $10,000, to assist them in re-building and enlarging their manufacturing establishment in the town of Wingham.

The furniture factory and sawmill of the Valliere Furniture Company, Quebec City, has been totally destroyed by fire. The outbreak started in the sawmill. As a result of the fire, the walls of the buildings (four storeys in height) only remain.

The Preston Woodworking Machinery Company, Limited, advise us that their factory is quite busy and that they are well satisfied with the volume of business. They are an entirely independent concern and have been operating their plant steadily.

The National Furniture Company, Limited, have been incorporated with a capital of $40,000. The head office is at Berlin, Ont., the western headquarters being in Vancouver. The operations of the company will consist of the manufacture and sale of furniture.

Messrs. A. T. and W. J. Thompson have commenced laying the foundation for a new planing mill at New Toronto. It will be a two-storey, corrugated iron building, 50 x 54 ft. in size, with a carpenter shop above. Five machines will be installed and run by electric power.

Mr. Joseph Begley read an instructive paper on "Wood and Its Various Uses in Building and Industries," at a meeting of the Peterborough Mutual Improvement Club recently. In a lengthened survey of the subject Mr. Begley discussed the qualities of over twenty of the principal woods.

The second storey of the new Hurley Printing Company's building has been secured by the representative of A. G. Spalding & Bros. for their Brantford plant for the manufacture of gymnasium and playground apparatus. The factory is expected to be in operation by February 1st.

Damage estimated at $30,000 was caused by a fire which destroyed the main building of the Handles factory, Strathroy. Mr. J. W. Cameron is president of the company operating the factory which has a big output of wooden goods, including fork handles and other farm implements.

The Canadian Last Block Company, Limited, has been incorporated with a capital of $50,000, to carry on business as shoe last manufacturers, with head office at Montreal. The provisional directors are O. Dufresne, of Maisonneuve, E. Robin, L. P. Delongchamps, and J. Ouimet, of Montreal, and A. Martel, of Iberville, Que.

Work on the Brantford Piano Case Company's new factory is being rapidly pushed to completion, and prospects are said to be bright for a successful industry. Mr. M. S. Phelps, who will be general manager, has had a lifelong experience in the business. Messrs. W. D. Schultz and Joseph Ruddy are provisional directors of the Company in conjunction with Mr. Phelps.

In a despatch from Antigonish, N.S., it is stated that the Colonial Lumber Company has completed the equipment of a plant for the manufacture of hardwood flooring, veneering, wainscotting, etc. They have timber areas in Antigonish and Guysboro counties that will assure a supply of 4,000,000 feet annually. The company will commence operations in the early spring. The plant represents an investment of over $200,000,

Mr. Arthur Rushforth, managing director of the Dominion Mahogany and Veneer Company, Limited, Montreal, has resigned his position with this company on account of his extensive interests in England, and Mr. George Kersley, the manager of the concern, has been appointed managing direc-

Wanted

A good Sash and Door Factory Foreman for a small plant. Must do laying out. Steady job. Apply to The John Carew Lumber Co. Ltd., Lindsay, Ontario. 12-1

Factory Superintendent

Of high-grade interior finish, or any kind of woodwork. Detail work a specialty. Good references. Apply,

A. C. TRORY, 273 Booth Ave., Toronto.

For Sale

Planing Mill and Retail Lumber Business in City of Stratford, Ont Solid two-storey brick building and basement. Machinery in good running order. Good reasons for selling. KRUG, VOGT & CO., Stratford, Ont.

11-12 1

Wood Screws For Sale

We will sell at reduced price a large quantity of Wood Screws, in first class condition. List of sizes on application.

DOHERTY PIANO CO., Limited,
Clinton, Ontario

7% INVESTMENT 7% **PROFIT SHARING**

Sums of $100, $500, $1000 and up. Safe as any mortgage. Business at back of this Security established 28 years.

Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bdg. TORONTO

OVER 65 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.

MUNN & Co. 363 Broadway, **New York**
Branch Office, 625 F St., Washington, D. C.

Stock Panels

We carry in our shipping room at all times a large assortment of stock panels, mostly 3-ply, ¼ inch thick, in **Plain Oak, Quarter Sawed Oak, Mahogany, Birch and Maple,** both one and two good sides from which we *can ship same day order is received.*

Veneer panel making is our specialty, and we claim that the panels we make are cheaper in the long run for they

Will not come to pieces after they are in the furniture

Do you see the point?

Send us your orders, or ask for Stock List

If we do not have on hand what you want, can build and ship promptly anything in 3 or 5-ply.

The
Gorham Brothers Company
Mt. Pleasant, Mich.

PATENTS

Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO

Write for Booklet

PATENTS

STANLEY LIGHTFOOT
Patent Solicitor and Attorney
Canada $45.00 United States $65.00
Lumsden Building - TORONTO, CAN.

Save the Wear on your Machinery Reduce your Fire Risk
Increase the Efficiency of your Plant

BY INSTALLING OUR

Slow Speed, Lower Power Blower Systems

IMPROVED AUTOMATIC FURNACE FEEDERS

For removing shavings, sawdust, emerydust, lint, smoke and odors.

DESIGNS AND ESTIMATES FREE.

TORONTO BLOWER COMPANY - 156 Duke St., TORONTO

tor in his stead. Mr. Kersley has had extensive experience in the mahogany and veneer business in both the European and American markets.

The firm of Rhodes Curry Company, Limited, whose woodworking and cabinet shops are at Amherst and Sydney, with branch warehouses at Halifax and elsewhere, are reaching out across a very wide radius in the distribution of their products which embrace building materials of every description, school, bank and office furniture and fittings. In the last few years some of the leading churches in Cape Colony have been furnished with seating and fittings manufactured at "busy Amherst."

The building erected last year for the Amherst Pianos, Limited, is 200 feet by 50 feet, and 75 workmen are employed. The present weekly output is fifteen pianos with a prospective increase to fifty. There are 23 machines of the latest type, amongst the factory's equipment being a 40,000 feet capacity dry kiln, the Gruff varnish drying system, automatic hydraulic veneer press, etc. Mr. J. A. Macdonald is the chief controlling influence of the factory, which is one of the most up-to-date in the country.

The Quebec Government propose to increase from $5,000 to $8,000, its grant to the Forestry School, which is affiliated with Laval University in Quebec. In return for the larger grant the Laval authorities will give a longer course of studies and the number of lectures for the year will be increased from 900 to 1200. The course in forestry is three years, consisting of instructions in the nature of different kinds of soil suitable for the growth of trees, the classification of timber, and elementary engineering. Laval University is constructing a new wing at the cost of $60,000 in which the Forestry School will be conducted.

The visit of manufacturers from all over Canada to the Maritime Provinces last September for the annual convention of the Canadian Manufacturers' Association has given a decided impetus to the industrial development movement in that progressive part of the Dominion. Among the places visited was Amherst, which according to a recent compilation contains about three thousand working people identified with the various industries. Windsor, N.S., is going ahead in the woodworking industry as is shown in the fact that the Windsor Furniture Company employs 75 to 80 men, a new Linderman glue joiner which grooves, glues and clamps all kinds of wood, having been installed last summer. Mr. J. E. Smith's rattan factory has turned out a large stock of chairs this season, making fully eighty varieties in many designs.

Western Canada

The Medicine Hat Planing Mills was built and placed in operation, with an investment of approximately $15,000.

The Monarch Lumber Company, Limited, has purchased the business of the A to Z Lumber & Supply Company, Limited, at Zelma, Sask.

The implement warehouse of Messrs. Bridge & McCulloch, of Carman, has been destroyed by fire. The loss, which is heavy, is covered by insurance.

The Lulu Island Shingle Mills at Eburn, B.C., were destroyed by fire on December 11th, the drying kiln containing a large quantity of shingles being burnt out.

Mr. Harry C. Moore, Blairmore, Sask., has announced his intention to build a wood distillation plant at Cranbrook, B.C., to handle the by-products of pine forests.

Mr. James Ramsey, of the firm of Messrs. Ramsey, Limited, Edmonton, is said to have made the largest purchase ever effected by an Edmonton firm, when on December 26th, he acquired the greater part of the furniture stock of the Copland-Fletcher Company, Saskatoon, representing a stock value of nearly $40,000, all of which was sold at the rate of 40 cents on the dollar.

The sawmill of the Valley City Lumber Company, Limited, Valley City, Alta., has been destroyed by fire. It is reported that the plant is being rebuilt, and that considerable new machinery will be added.

La Compagnie J. A. Gauvin, Limited, has been incorporated with a capital of $49,900, as furniture manufacturers, etc., with head office at Beaupor, Que. The provisional directors are J. A. Gauvin and J. N. Fortier, both of St. Joseph de Levis.

Hon. W. R. Ross stated at a meeting of the Western Forestry and Conservation Association in Vancouver on December 16 that probably seventy per cent. of British Columbia's two hundred and fifty million acres was under some kind of timber.

The Kootenay Mills, Limited, contemplate the erection of a mill and sash and door factory at Kaslo, B.C. Operations will be started about the end of this month. A full line of modern machinery is to be installed. The president of the company is Mr. J. W. Sifton, of Moose Jaw.

The Land and Forest Department of Ireland is desirous to procure seeds of spruce and fir as grown in British Columbia for reforestation purposes. The chief forester has referred the enquiry to the Indian Department, as the Indians in many places make a practice of gathering such seeds.

The Fort Qu'Appelle Boat Building and Wood Manufacturing Company, of Fort Qu'Appelle, Sask., anticipates the erection at an early date of a $42,000 planing mill. The new building will include a woodworking shop, boat building department and planing mill, and will be principally of brick and concrete construction.

A convention of the Western Forestry and Conservation Association comprising the associations of Montana, Idaho, Washington, Oregon, California and British Columbia, was held in Vancouver on December 15-16. Mr. A. L. Flewelling, of Spokane, Wash., presided over the deliberations, which proved highly interesting.

The Winnipeg Broom Manufacturing Company, Limited, has been formed for the purpose of manufacturing brooms, broom-corn, lumber, rope-wire, hemp and other materials. The capital stock is $40,000, the provisional directors of the company being Messrs. Chas. V. Alloway, Henry J. Horan, J. Provisor, Edward Spice and Herbert J. Symington, all of Winnipeg, where the head office will be located.

Among the seasonable souvenirs received by the Canadian Woodworker is an attractive calendar from Gorham Brothers Company, Mount Pleasant, Mich., manufacturers of high-grade veneered panels. The numerals are in good plain type and the calendar is a particularly useful one for office purposes. The subject of the view is "After Big Game," this being a reproduction from the original painting by Philip R. Goodwin. It depicts a hunter, with his guide, just about to pot a big bull moose. The scene is a most realistic one and the calendar is serviceable.

The Simonds Manufacturing Company, with factories at Fitchburg, Mass., and Chicago, Ill., began the new year by opening an office at 209 Madison Avenue, Memphis, Tenn. This move has been made necessary by the continually increasing demand for Simonds large circular and band saws, especially among the better mills in Memphis and in the adjoining territory in Tennessee and Arkansas. A complete stock of Simonds Saws suitable for that territory, Simonds Planer Knives and Files will be carried at the new store. The Memphis branch is under the management of Mr. William L. Mayer, who formerly represented the Simonds Company among the mills in Virginia and North Carolina.

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

Section of main floor Exhibit and Salesrooms

52 Lines
of New
Machinery
the Largest
Stock in
the World.

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

Still Making Window Pockets by Hand?

Why Not Figure Up What You Are Losing?

Machine does everything shown above.

That would give us a chance to talk to you about our **Perfect Window Frame Machine,** with which you can cut window pockets for about one-tenth what hand-made ones cost. Of course it cuts them ten times as fast and this gives you an advantage in enabling you to make quick deliveries that mean dollars to you in enlarging your business. With this machine you have your hand-working competitors beat to a finish. You can even sell the carpenters the stiles bored, mortised and dadoed, letting them nail them together and still get the cream of the profit, which in window frames as in other manufactures is in the machine work.

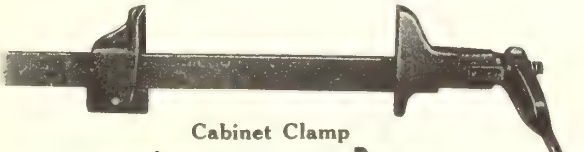
Why Not Get In The Game?

Smith & Phillips Mfg. Co.

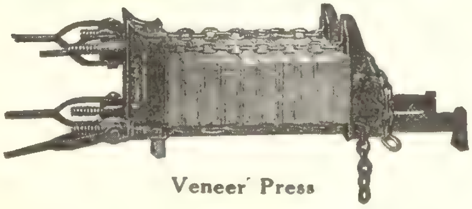
412-422 N. Sangamon Street, CHICAGO, ILL.

Our Combination Stair Router, Edge Jointer, Sash Groover and Light Shaper is also an attractive proposition.

"Pioneer" Moulding Sander Power Veneer Presses

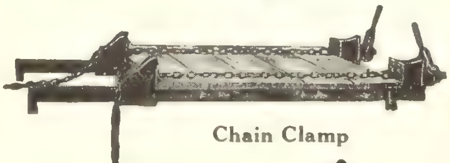


Cabinet Clamp



Veneer Press

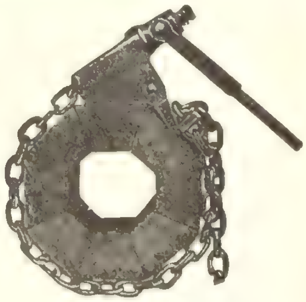
Write for
Catalogue
and Prices



Chain Clamp

Black Bros. Machinery Co.

Mendota, Ill.



Column Clamp

LISTEN

We are one of the largest manufacturers of special **Hardware for Store Fixtures and Show Case Manufacturers** in the World. Our latest catalogue fully describes every metal specialty you use in show cases and store fixtures. Send for a copy—It will save you money.

The Reflector & Hardware Specialty Mfg. Co.

Western Ave. and Twenty-Second St. - - - CHICAGO, ILL.

TIMMS, PHILLIPS & CO.
VANCOUVER, B.C. Limited

Write us for attractive prices on

Clear Douglas Fir
Clear Red Cedar
Clear Spruce

Also X X X Red Cedar Shingles

Canadian
Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

No Intermediate Profit in
MAHOGANY
Lumber and Veneers

WE own and operate our own Mahogany land and are a direct line from stump to consumer.

ALSO

Circassian Walnut Veneers

The Celebrated "Ж" brand

Lewis Thompson & Co., Inc.

Canadian Representative: Mr. Robert Dewart, Rochester, N.Y.
Offices: Philadelphia, Penn., and Laguna, Mexico.
Yards and Veneer Warerooms: Astoria, Long Island, N.Y.

Books For Sale

The following books are offered at special prices subject to previous sale:

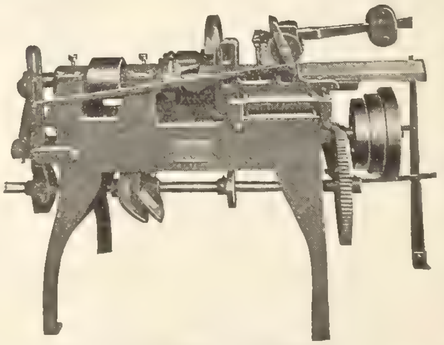
- **Saw Fitting Manual**, a treatise on the care of saws and knives. Deals with everything in the saw and knife alphabet, from adjustments to widths. 144 pages. Price $2.00.
- **Common-sense Handrailing**, by Fred T. Hodgson. Published by Frederick J. Drake & Company, Chicago. 114 pages, illustrated. Price 50c.
- **Roof Framing Made Easy**, by Owen B. Maginnis. Published by The Industrial Publication Company, New York. 164 pages, illustrated. Price 50c.
- **Handrailing Simplified**, by An Experienced Architect. Published by William T. Comstock, New York, 52 pages, illustrated. Price 50c.
- **Practical Centering**, by Owen B. Maginnis. Published by William T. Comstock, New York. 80 pages, illustrated. Price 50c.
- **How to Join Mouldings; or, The Arts of Mitering and Coping**, by Owen B. Maginnis. Published by William T. Comstock, New York. 72 pages, illustrated. Price 50c.
- **The Book of Lumber Shed Construction**, by Met. L. Saley. Published by American Lumberman, Chicago. 176 pages, illustrated. Price $1.00.
- **Furniture Designing and Draughting**, by Alvan Crocker Nye. Published by William T. Comstock, New York. 100 pages, illustrated. Price $1.00.
- **Popular Mechanics Shop Notes**, Published by Popular Mechanics, Chicago. Easy Ways to do Hard Things, etc. Years 1905-1906-1907-1908-1909. Price 40c each.
- **Cabinet Making**, by J. H. Rudd. Published by Grand Rapids Furniture Record Company. 210 pages, illustrated. Price $1.50.
- **Modern Practical Carpentry**, by George Ellis. Published by B. T. Batsford, London. 378 pages, illustrated. Price $1.50.

Woodworker Publishing Company,
Limited
Nicholls Building,
Toronto, - Ontario

For Long Timbers
Surfaced or Rough
in Douglas Fir
or for
B.C. Red Cedar Shingles
Write or Wire

W. G. Scrim Lumber Co.
Vancouver, B.C.

Makes Wooden Plugs from Scraps



The demand for wooden plugs to jam the ends of big rolls of paper is much greater than the supply. The paper mills can't secure enough of them. This machine automatically makes 20,000 of these plugs in ten hours, from short stock and scraps around the plant. We have full particulars which we will be glad to send you. Testimonials? Yes, lots of them. Better write us to-day.

EAGLE MACHINE WORKS,
332 Market St.
Indianapolis, Ind., U. S. A.

Southern Red and Sap Gum

Our Specialty

Plain and Quartered sawn, and sorted for Mahogany or Circassian Finish. We guarantee our Gum to be as straight as any other wood. If you have used gum and had bad luck, let us talk to you about it, and if you have never used gum and desire a fine cabinet wood that will take any finish let us tell you how to get the best results. Also

Fine Figured Quartered White Oak

G. H. Evans Lumber Co.
Hardwoods and Pine
CHATTANOOGA, TENNESSEE, U. S. A.

WE CARRY THE LARGEST AND MOST COMPLETE STOCK OF

Walnut Lumber

IN THE WORLD.

Write us for prices on any grade,
1/4″ to 4″ in thickness.

2,000,000 FEET ALWAYS IN STOCK

EAST ST. LOUIS WALNUT CO.
East St. Louis, Illinois, U.S.A.

LUMBER

RIGHT Prices

GOOD Grades

PROMPT Shipments

We have the following lumber that we want to move:—

2 Cars 8/4 Soft Maple No. 1 Com. and Better
3 " 12/4 " No. 1 "
5 " 12/4 Hard Maple No. 1 "
3 " 16/4 " No. 1 "
4 " 4/4 x 12 - 10/16 White Pine M.R.
also 2 x 6, 2 x 8, 2 x 10, 2 x 12 White Pine M. R.
5/4 x 4 and 5″ and 6/4 x 10 " Com. and Dress.

The above is all well manufactured and dry, we solicit your inquiries.

Full line in all kinds of Canadian Lumber

C. G. ANDERSON LUMBER CO. Limited
Manufacturers and strictly Wholesale Dealers
MANNING CHAMBERS, - TORONTO

OHIO
Hardwood Manufacturers and Dealers

Distributing yards :—Baltimore, Md., Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co., CINCINNATI, OHIO.

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES.

THE
GOTSHALL MFG. CO.
TOLEDO, OHIO
Hardwood Manufacturers

We carry dry stock in

Quartered and Plain White and Red Oak,
Ash, Hickory, Cottonwood,
Sycamore, Cherry
Walnut & Maple
cut from Northern Ohio timber

¶ We solicit enquiries for furniture, bending and wagon stocks, timber and piling. We have two Band Mills.

5/8" Soft Yellow
POPLAR
Selected to Widths

7 to 11" wide 18 to 23" wide
12 to 17" wide 24 to 28" wide
29 to 37" wide

All grades and thicknesses of

Yellow Poplar—Red Gum
White Oak, Ash, — Mahogany
Chestnut — Cherry
Hickory Lumber—Hickory Axles

Charles F. Shiels & Co.
CINCINNATI, O.

OAK and RED GUM
OUR SPECIALTY

At our Tennessee mill we are producing some choice
Plain and Quartered Red and White Oak. Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

Prompt Shipments and High Grades our Hobby. Let us quote you on your requirements.

Mills—TENNESSEE
ARKANSAS

DUHLMEIER BROTHERS

Main Office & Yard,
CINCINNATI, OHIO,
U. S. A.

INDIANA HARDWOODS

Young & Cutsinger *Manufacturers and Wholesale Dealers*

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

S. Burkholder Lumber Co.
Crawfordsville, Indiana

Wholesale Dealers and Manufacturers

Indiana Hardwoods

We manufacture all kinds of white and red oak in plain and quartered, also sap and red gum, hickory, ash, cottonwood, car stock, railroad timbers and ties.

SEND US YOUR ENQUIRIES

Long-Knight Lumber Company

Circassian, Veneers, Mahogany
Hardwood Lumber

INDIANAPOLIS - - INDIANA

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 12

AUTOMATIC DOVETAIL GLUE JOINTER
[illegible] Machine Company, Woodstock, Ont.

BABBIT METALS
[illegible] Metal Company, Toronto
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sinker-Davis Co., Indianapoils, Ind.

BAND SAWS
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.
Federal Engineering Co., Toronto.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Porter Machinery Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R.. Toronto.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

CABINET PLANERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.

DOVETAILING MACHINES
Advance Machinery Co., Toledo, Ohio.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.

EDGERS (Gang)
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Advance Paint Co., Indianapolis, Ind.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Advance Machinery Company.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.

GLUE SPREADERS
Advance Machinery Co., Toledo, Ohio.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT
Advance Machinery Co., Toledo, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Porter Mach. Co., C. O., Grand Rapids, Mich.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Anderson & Co., C. G., Toronto, Ont.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Powell Myers Lumber Co., South Bend, Ind.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Young & Cutsinger, Evansville, Ind.
Thompson & Co., Lewis, Philadelphia.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill
Canadian Boomer & Boschert Co., Montreal.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Anderson Lumber Co., C. G., Toronto, Ont.
Burkholder Lumber Co., S., Crawfordville, Ind.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.
Young & Cutsinger, Evansville, Ind.

MACHINE KNIVES
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Advance Paint Company, Indianapolis, Ind.
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Sidney Tool Co., Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer & Boschert Press Company, Montreal, Que.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Preston Woodworking Mach. Co., Preston, Ont.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS
Porter Mach. Co., C. O., Grand Rapids, Mich.

SANDERS
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Black Bros. Machinery Co., Mendota, Ill
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Williams Machinery Co., A. R., Toronto, Ont.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Porter Mach. Co., C. O., Grand Rapids, Mich.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Smith & Phillips Mfg. Co., Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass

SHELLAC
Advance Paint Co., Indianapolis, Ind.
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby Company, A. B., Toronto, Ont
Sheldons Limited, Galt, Ont.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES

Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

STAINS

Advance Paint Company, Indianapolis, Ind.
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE

Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS

Canadian Morehead Mfg. Co., Woodstock, Ont

STORE FIXTURES & FITTINGS

Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS

Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES

Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES

Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS

Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER

Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Hutchison, M., Toronto, Ont.
Sidney Tool Company, Sidney, Ohio.

VARNISHES

Advance Paint Co., Indianapolis, Ind.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS

Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Company, Indianapolis, Ind.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)

National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Strong Veneer Company, Jamestown, N.Y.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Veneer Manufacturers Co., Chicago, Ill.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS

Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)

Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.

VISES

Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WALNUT LUMBER

East St. Louis Walnut Co., East St. Louis, Ill.

WINDOW FRAME MACHINERY

Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES

Advance Paint Co., Indianapolis.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES

Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE

Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS

Robertson & Company, P. L., Milton, Ont.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher and the Amateur Student

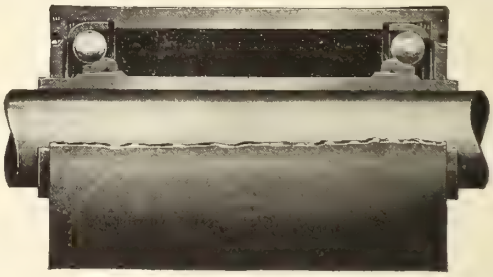
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS

BRAND

HOLDS THE WORLD **VEGETABLE GLUE** HOLDS THE WORLD

SETS—STICKS—STAYS

Is Your Glue Room Insured Against Cold Weather?

Would you like to be free from cold air blisters, and do away with hot cauls? This is but one of the many advantages of

ATLAS GLUE

It is heat proof, odorless, reliable and economical. It has great strength, is very durable, is absolutely uniform, it sets properly, and it does not injure the hands.

You Are Going to Use Atlas Glue Eventually

Our research department will continue to keep us as far ahead of the "just as good's" as we are right now; and the sooner you write us about your work and learn what we can do for you, the better off you will be.

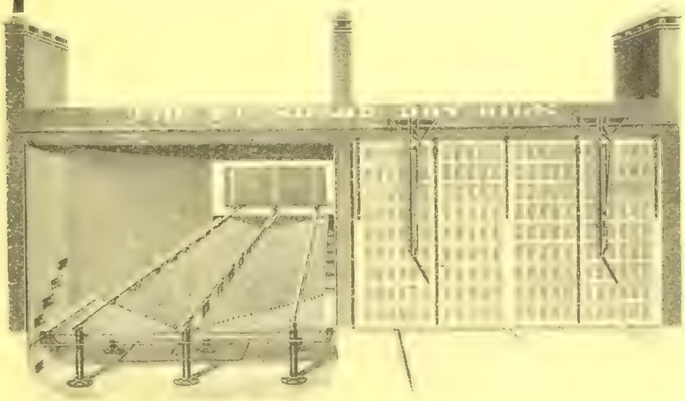
Quality First—Then Economy—Atlas Gives You Both.

National Process Company
Manufacturers
Indianapolis, Indiana, U. S. A.

USERS

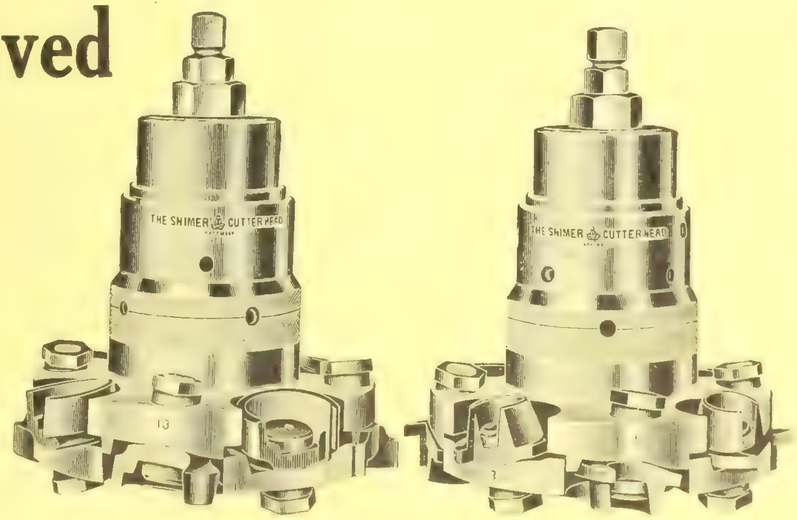
of The Standard Moist Air Dry Kiln—people in your own line, whose drying proposition is similar to yours—will tell you that never before was their product dried so satisfactorily and so economically. Ask them!

You'll find a long, long list of Standard Dry Kiln users in the catalog. Also a complete explanation of why the Standard Moist Air Drying System is so adaptable for drying veneers and hardwood flooring. Write for this book. Address: The Standard Dry Klin Co., 1560 McCarty St., Indianapolis, Ind.



Every Hour Saved

By the Use of The Shimer Limited Cutter Heads



Adds to the capacity of your mill. These heads are built especially for the High Speed Matcher and will tongue and groove flooring at 150 to 170 lineal feet or more per minute.

They are self-centered on the spindles by means of a chucking device which grips firmly thereto when drawn up, insuring all the cutters doing their share of the work and removing the objectionable set screw which has hitherto been used for fastening purposes.

The Bits carry a larger areal surface and the Bit chambers are of greater depth to compensate for the new acute angle given to the Bits for greater relief to the parts coming into contact with the lumber.

Price, net, in solid section, complete for making flooring $67.00. With Expansion feature like illustrations $72.46.

SAMUEL J. SHIMER & SONS, Galt, Ont. Can.

Marietta finishes

are not the cheapest nor the dearest. They are the most economical.

Tell us the character of furniture you want it for and the result you desire to accomplish. We will produce the stains and the fillers you need, and the price will be in proportion to the quality required.

It is our daily solution of practical finishing problems that has given us our reputation as a practical house.

Let us demonstrate our new **NON-FADING** mahogany stain.

The **MARIETTA**
PAINT & COLOR CO.
Marietta, Ohio

Marietta means Practical

Volume Fourteen TORONTO, FEBRUARY, 1914 Number Two

Canadian Woodworker

For better surfacing and more of it buy a

Whitney Motor-Driven

Single or Double Surface Planer

"Make-it-pay" is the religion of modern business. We can tell you concisely, if you write, why a Whitney Planer is going to pay dividends in the form of easily-won profits from the day it is installed in your plant—our telling will be of double interest to you because it will be backed up with statements by leading concerns in your own line who looked for the best planing machine value and found it in the Whitney Planer.

We will describe various equipments, applicable to Whitney Planers, whether Belt Driven or Motor Driven, whether Single or Double Surfacer, that will make the machine you buy especially efficient for handling your planing—in some cases we advise square cylinders carrying two or four ordinary knives, for other work, round cylinders with four thin, high-speed steel knives, sectional rolls and steel sectional chip breakers or flexible steel chip breakers.

May we send you the details?

Baxter D. Whitney & Son, Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives; Henry Kelly & Co.
26 Pall Mall, Manchester, England.

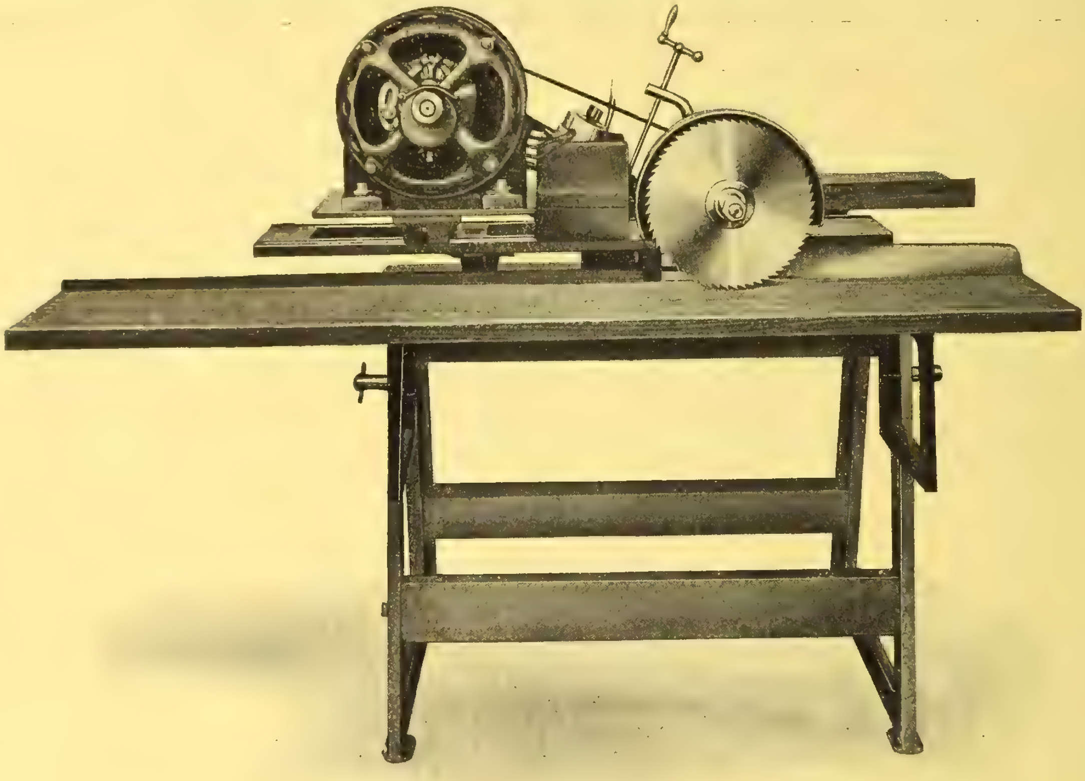
Alphabetical List of Advertisers, page 10

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders Cabinet Makers, Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

Here are a few people who are using our machines:—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.

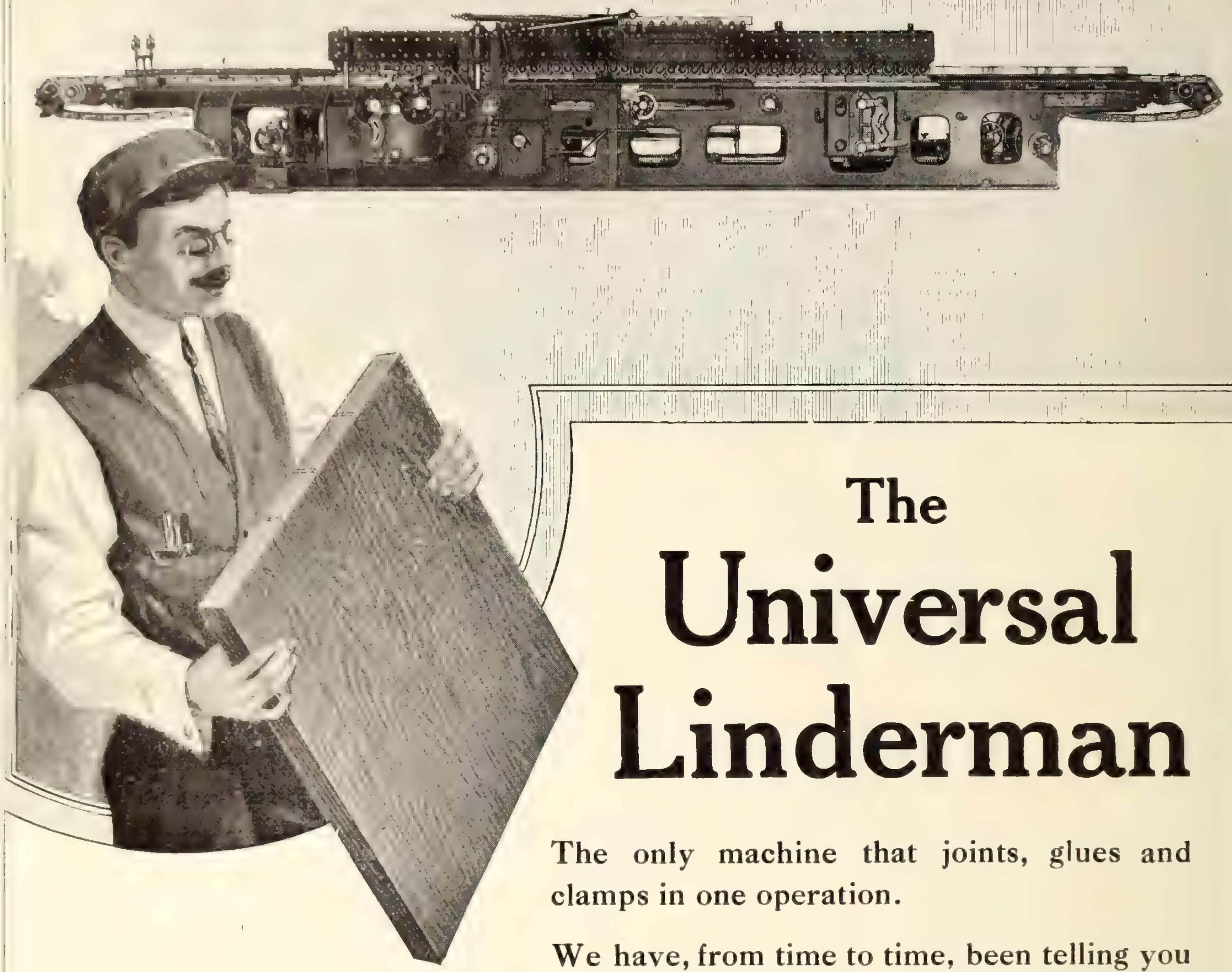
Simonds Saws Satisfy

And satisfactory service is one of the most desirable features in a circular or band Saw. It means that the saw is made right and from the right kind of materials—in this case Simonds Steel made in our own mill. We guarantee the Simonds Saw because we have faith in its perfection based on a reputation for manufacturing high grade products running back for eighty-three years. Let us supply your requirements in Saws or Woodworking Machine Knives of all kinds.

Simonds Canada Saw Co., Limited

St. Remi St. and Acorn Ave.,
Montreal

St. John, N.B.
Vancouver, B.C.



The Universal Linderman

The only machine that joints, glues and clamps in one operation.

We have, from time to time, been telling you what the LINDERMAN is doing for others.

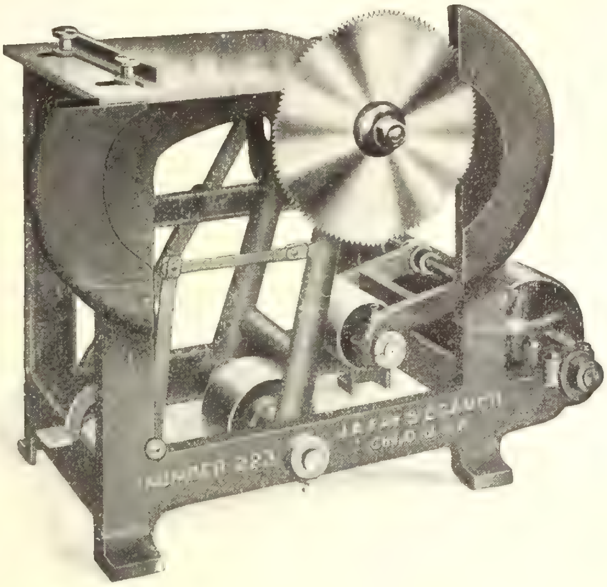
Give Us An Opportunity To Tell You What It Will Do For You

Without the slightest obligation on your part, one of our staff will, with your permission, make a survey of your plant. This will present data on which you can base the real value of the LINDERMAN process in connection with your plant.

WRITE US TO-DAY

Canadian Linderman Co., Limited

Muskegon, Mich. —Works at Woodstock, Ont.



With both hands free on a 223, your swing saw operator can double and triple his output

> "Am delighted with our No. 223 Swing Cut-Off Saw. It cuts fast and accurate, and because the operator has the use of both hands, he can cut several times more crating than with the old swing cut-off."
>
> *C. A. Simonton, Supt. Schill Bros. Mfg. Co., Crestline, O.*

— No more time lost reaching for and pulling the saw into the work when you have a No. 223 Inverted Swing — a slight pressure on the foot treadle brings the saw into the cut and it returns automatically when pressure is released, leaving both hands free to handle stock.

—No overhead rigging to cause accidents.

—No wall or ceiling needed; a 223 is entirely self-contained and can be placed anywhere most convenient.

—Costs little more than a good overhead swing saw.

Will cut up to 20″ wide and 6″ thick.

—Saw stroke cushioned and adjustable for varying widths.

A request for Bulletin 17 Q brings full information and price.

J. A. FAY & EGAN COMPANY

153-173 WEST FRONT ST. CINCINNATI, OHIO, U. S. A.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

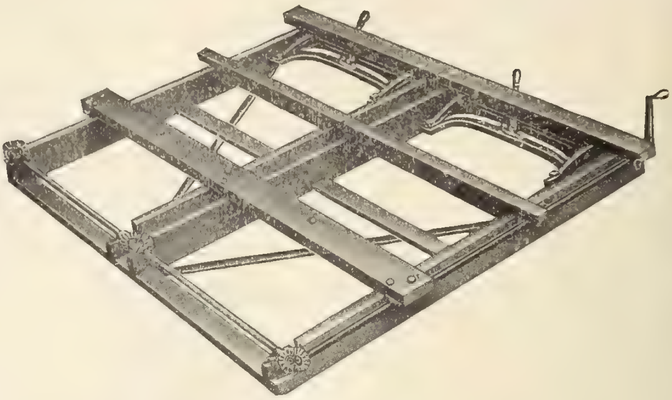
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



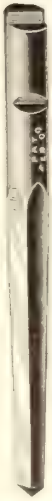
GRAND RAPIDS

Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

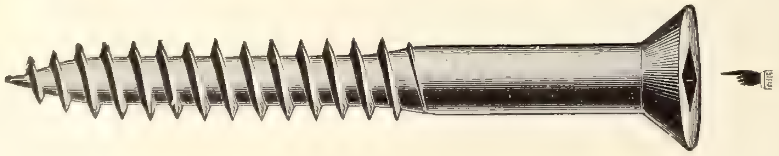
Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.



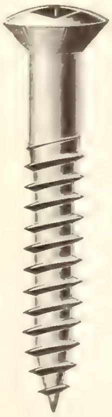
ROBERTSON SOCKET HEAD

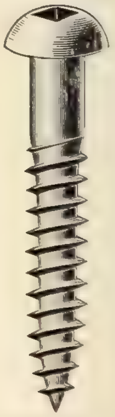
Wood Screws



See That Square Hole

Pat. Feb. 2, 1909





THIS IS A REAL WOOD SCREW

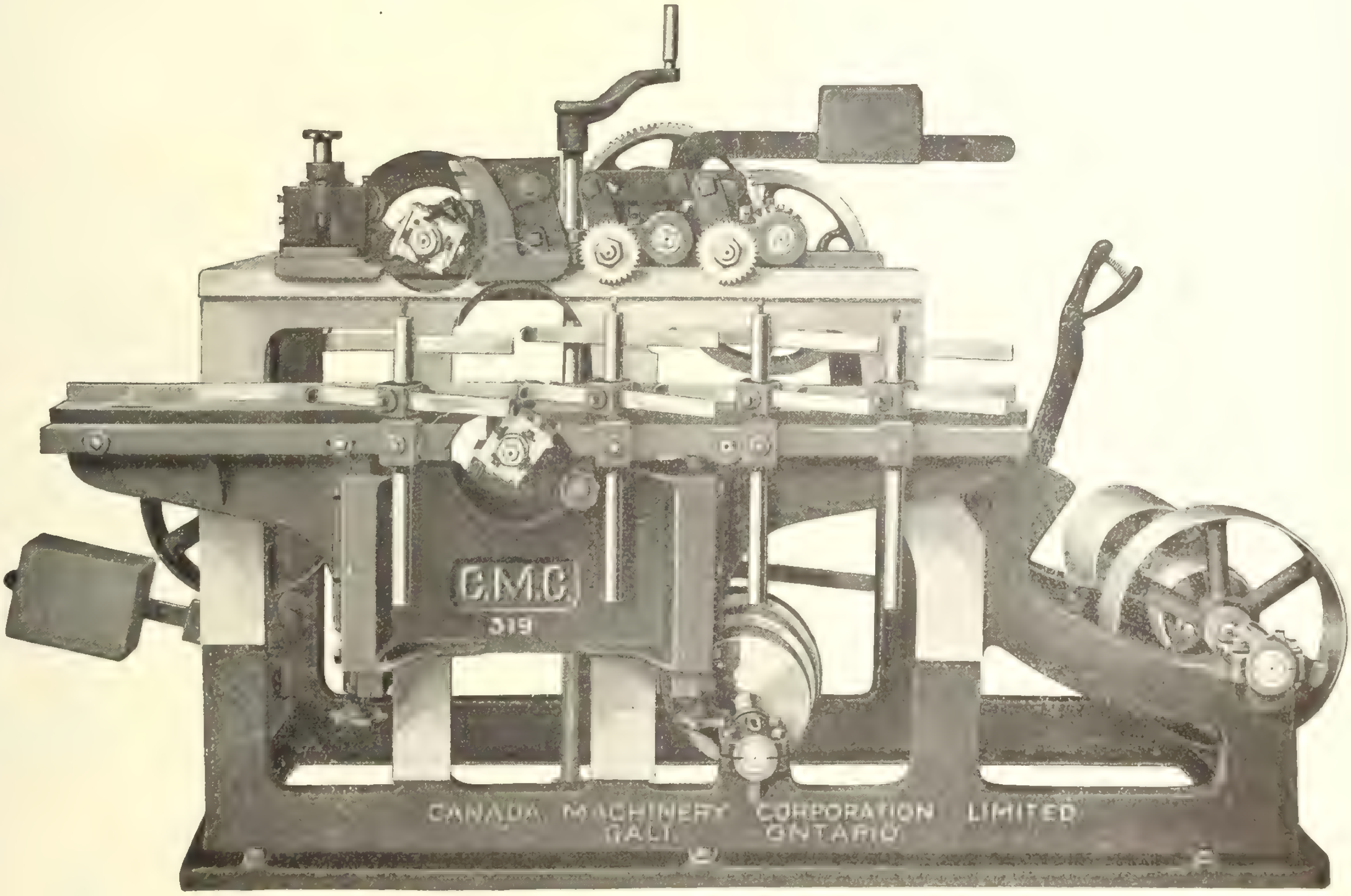
It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited

MILTON :: ONTARIO

DOOR STICKER C.M.C. SASH STICKER



No. 319 DOUBLE SASH AND DOOR STICKER.

This machine has been especially built and designed for the rapid making of stiles and rails for doors and sash.

Particular attention has been paid to the ease of manipulation and accuracy of adjustment.

The Feed Drive is of our improved down driven gears. All gears are carefully cut from the solid.

We have just issued a new bulletin No. 319, fully illustrating and describing this machine, which we will be pleased to forward on request.

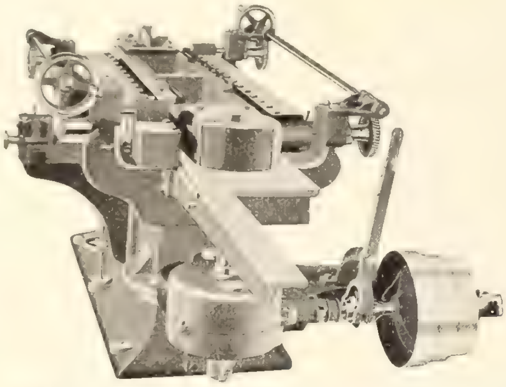
CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

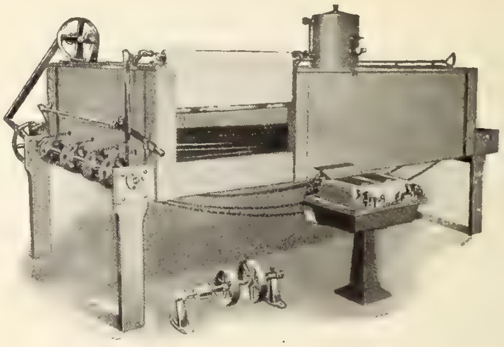
Largest Builders of High-Class Woodworking Machinery in Canada.

Your Glue Room

Is it modern and up-to-date? Does it contain real **labor saving** equipment? Or are you overlooking the **big** important advances made recently, as a result of years of experiment, in this vital part of the factory?



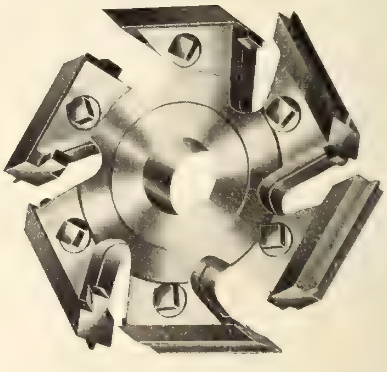
"Number Six" New Diehl Continuous Feed Glue Jointer. You will be glad you sent for circular describing this machine. So will we.



Automatic Stock Heater and Conveyor. Soon saves its cost, in time, handling, and perfect joints.

We are specialists for the Glue Room. We manufacture everything needed to make it complete. Our equipment is designed to give **Speed—Endurance—Economy**—and includes Glue Jointers, Stock Heaters, Patent Glue and Water Scales, improved Glue Heaters, Glue Spreaders and Glue Clamps, besides a complete line of Cutter Heads.

Tear out this page, put your name and address on the margin, mail it to us, and we will gladly send you our complete catalog.



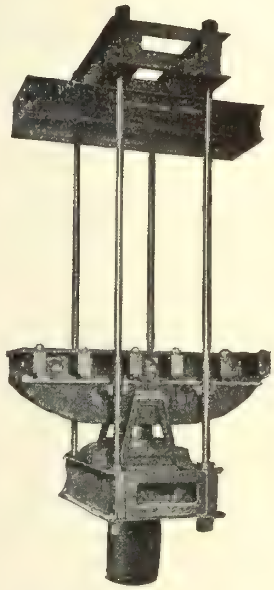
Send for booklet which fully describes **The Diehl Cutter Head.**

The Diehl Machine Works

"On the Banks of the Wabash"

Wabash, Ind., U. S. A.

Hydraulic Veneer Press



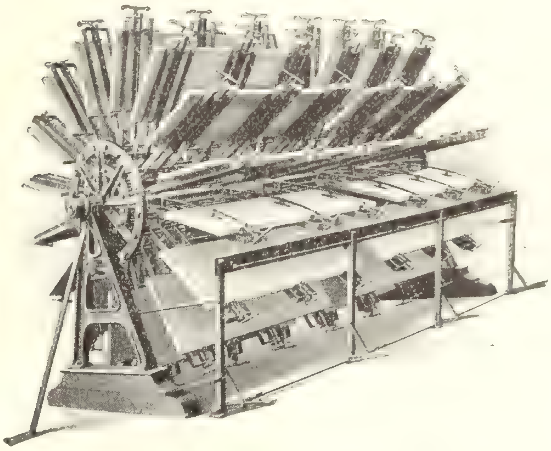
We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

The PALMER
Perpetual Revolving Clamp

"Built to Last"



This machine is in successful operation all over America. It helps you with rush orders and cuts down your gluing expense. Built carefully of the best materials.

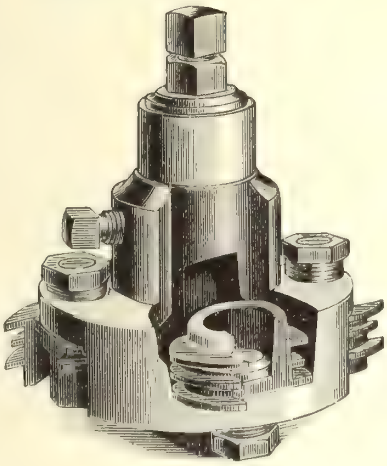
We also make a full line of gluing clamps.

Send for our Catalog

A. E. PALMER & SONS
OWOSSO, MICH.

Double Matcher or Moulder Capacity

By the use of the Shimer Double Ceiling and Double Flooring Heads



Double Ceiling Head

100 per cent. gain in output by running your stock with double tongue and groove and then re-sawing, and all for an investment of only $40.94 and upwards.

The Bits on the Shimer Double Heads mark the saw cut line of division on the stock so that the sawyer can at once detect any variation of the saw and correct it as the board is passing through.

These Heads are no experiment. We have made them for years and they are in daily use in the best mills of this and other countries. You will find them very complete and practical tools, carrying the Shimer guarantee to do as represented or no sale.

We make a number of Heads for special purposes. For any design of material you get out in quantity let us give our estimate on the Head to do the work. Our prices are uniformly low—our goods of best quality.

SAMUEL J. SHIMER & SONS, Inc., Galt, Ont., Can.

Following are a few Net Prices of Tools which will be made to fit your machine and match your samples:

MATCHER HEADS

Figs. 22 and 23 with concave bit seats, without Bits	$24.30
Bits for Ceiling, the set of 8	10.40
Bits for Flooring, the set of 8	11.44
Bits for 2 inch Plank, the set of 8	13.04

JOINTER HEADS

Figs. 54 and 55, 4 bit seats each	$20.80
Jointer Bits 1¼ in. wide, each	1.30
Jointer Bits 2 in. wide, each	1.56

SHIP LAP HEADS

Figs. 38 and 39 4 bit seats to each Head, price net	$22.88
Bits for Jointing, 4	5.20
Bits for Rabbeting, 4	6.76

DOOR HEADS

Fig. 82, solid flange	$10.75
Fig. 84, with Expansion	13.35
Bits to work 1 in. to 1 [illegible] Doors (4)	7.25

DOOR COPE HEADS

Fig. 83, upper and lower copes to fit any tenoner (set 2 Heads)	$12.90
Bits extra, 4	5.72

SASH HEADS

Fig. 86, solid flange	$9.75
Fig. 206, with Expansion	12.35
Bits extra to work 1 in. to 1 [illegible]	[illegible]

Alphabetical List to Advertisers

Acme Veneer & Lumber Company ... 51
Adams & Raymond Veneer Company ... 52
Adjustable Clamp Company ... 10
Anderson Lumber Company, C. G. ... 61
Andrews Company, A. H. ... 11

Bass Bros. ... 58
Billstrom, Nels. J. ... 12
Black Bros. Machinery Company ... 59
Black Lumber Company, Fred W. ... 53
Buss Machine Works ...

Canada Machinery Corporation ... 7
Canadian Linderman Company ... 4
Canadian Morehead Manufacturing Company ... 16
Carborundum Company ... 15
Central Veneer Company ... 53
Central Veneer Company ... 54
Chapman Double Ball Bearing Company ... 66
Chicago Machinery Exchange Inc. ... 59
Clark Veneer Company, Walter ... 52
Curtis Machine Company ... 13
Cyclone Blow Pipe Company ... 14

Dennison, Herbert, J. S. ... 57
Diehl Machine Works, G. M. ... 8
Dominion Mahogany & Veneer Company ... 55
Duhlmeier Brothers ... 62

Eagle Machine Works ... 60
East St. Louis Walnut Company ... 61
Elliot Woodworker, Limited ... 2
Evans Lumber Company, G. H. ... 61

Fay & Egan Company, J. A. ... 5
Fox Machine Company ... 12
Francis Company, Chas. E. ... 58

Gorham Brothers Company ... 57
Goshen Veneer Company ... 53
Gotshall Manufacturing Company ... 62
Grand Rapids Hand Screw Company ... 6
Grand Rapids Veneer Works ... 57

Haughton Veneer Company ... 49
Hoffman Bros. Company ... 49
Hossafous, H. E. ... 53
Huddleston-Marsh Company ... 54

Jamieson & Company, R. C. ... 45

Keiths Limited ... 14
Kosse, Shoe & Schleyer Company ... 62

Licking River Lumber Company ... 63
Lightfoot, Stanley ... 57
Long-Knight Lumber Company ... 63

Marrietta Paint & Color Company ... 68
Meakins & Sons ... 44
Morton Dry Kiln Company ... 15

Nash, J. M. ... 11
National Process Company ... 67
National Securities Corporation ... 57
National Veneer & Lumber Company ... 52

Ober Manufacturing Company ... 11
Ohio Veneer Company ... 49
Ormsby Company, A. B. ...

Palmer & Sons, A. E. ... 9
Penrod Walnut & Veneer Company ... 60
Perkins Glue Company ... 67
Perrin & Company ... 9
Powell-Myers Lumber Company ... 63
Pryibil Machine Company, P. ... 12

Reflector & Hardware Specialty Mfg. Company ... 59
Robertson Manufacturing Company, P. L. ... 6

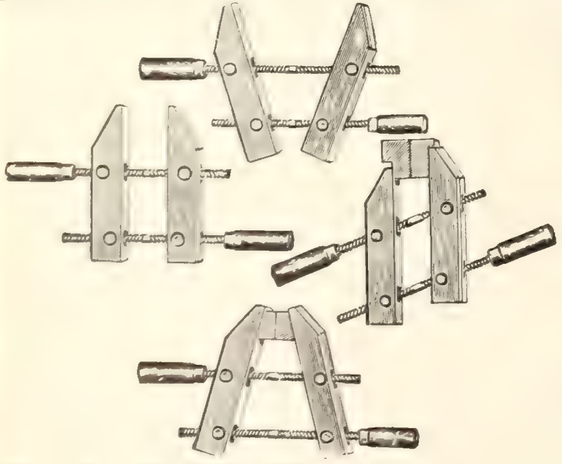
Saw Mill Owners Sales Company ... 56
Schmidt Company ... 45
Scientific American ... 57
Scrim Lumber Company, W. G. ... 60
Sheldons Limited ... 14
Shiels & Company, Chas. F. ... 62
Shimer & Sons, Samuel J. ... 9
Sidney Tool Company ... 15
Simonds Canada Saw Company ... 3
Sinker Davis Company ... 13
Smith & Phillips Manufacturing Company ... 59
Spencer, C. A. ... 60
Standard Dry Kiln Company ... 67
Strong Veneer Company ... 6

Thompson & Company, Lewis ... 52
Thompson Veneer Company, W. T. ... 49
Timms, Phillips & Company ... 60
Toronto Blower Company ... 57

U. S. Steel Tank & Pipe Company ... 14

Walters & Sons, H. ... 16
Wardell Manufacturing Company ... 13
Whitney & Son, Baxter D. ... 1
Wood & Son, Fred ... 15

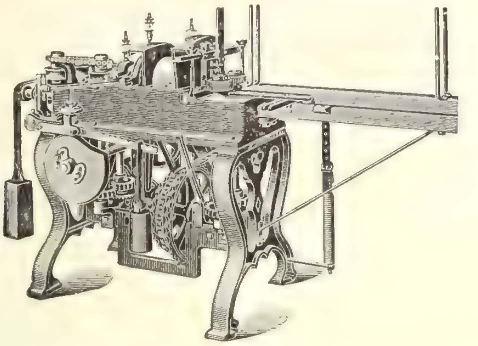
Young & Cutsinger ... 63



It Should Be Interesting

To know that the JORGENSEN HAND SCREW has proved itself to be so durable that we replace without charge any broken part. This guarantee costs us little, and yet we sell 4,000 dozens a year. Just think of this the next time you figure on the wooden spindle kind that you know you will SOON PAY TO REPLACE if you buy it. The JORGENSEN is in every way a superior tool—but little difference in the first cost.

Adjustable Clamp Company
215 N. Jefferson St., Chicago, Ill.



Constant Use is Practical Test

Read what one Handle Manufacturer says of our

NO. 10 LATHE

"It gives us great pleasure to state that we have had in our handle factory **for years in constant use**, one of your **No. 10 Automatic Lathes**, and it has been operated by different operators and we consider it one of the best machine we ever had in use.

It is the easiest kept up and turns very **nice smooth handles**. Have used all other manufacturers machines that are in use, I guess, and we consider this the favorite of all of them. If we were going to buy another machine it would be an **Ober**."

.... **HANDLE CO.**

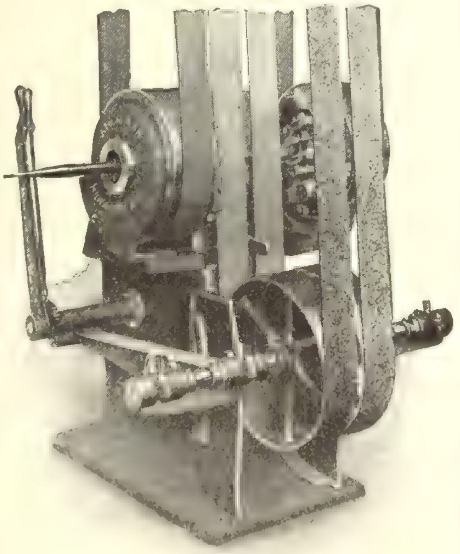
Name furnished on application.

We make Lathes for turning Fork, Hoe, Rake, Broom, Axe, Pick, Sledge, Hammer and Hatchet Handles and other turned work. Sanders, Bolting Saws, Rip Saws, etc.

Write for free catalogue No. 31

THE OBER MFG. CO., Chagrin Falls, O., U. S. A.

Does an 85 Percent Saving Look Good to You?



One boy with the Nash Sander will do as much sanding of
Chairstock
Dowel Rods
Shade Rollers
Curtain Poles
Hoe, Fork, Rake, Broom and Shovel Handles
Whipstocks
Flag Sticks
Ten Pins
Canes
Veneered Columns
as five men with hand belts. This means a saving of 85 per cent. in labor and 25 to 50 per cent. in varnish.

J. M. NASH, Milwaukee, Wis.

842-848 30th Street

Have You a Copy?

BULLETIN 200-L

Principles
of
Lumber-Drying
and
Practical Advice
to
Dry Kiln Operators

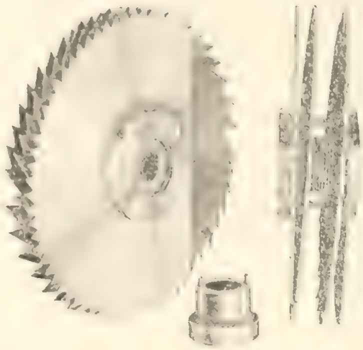
If you have not, or if you desire any reliable information concerning your present or prospective equipment, address,

The Drier Department
Engineering Division
of
The
A. H. Andrews Co.
115-117 So. Wabash Ave.
Chicago

Manufacturers of Efficient Dry Kilns

Trade FOX Mark

ADJUSTABLE



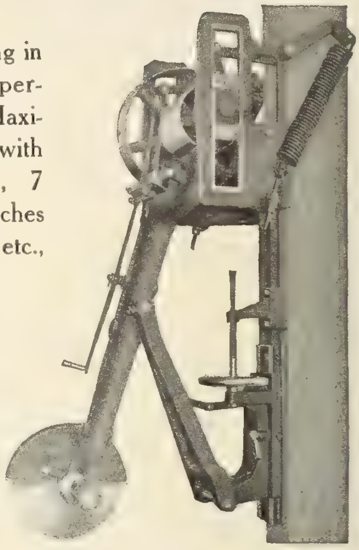
DADO HEADS

These heads, when open, cut a groove twice the width of groove cut with head closed, and they will cut absolutely any width between these extremes.

Write for Descriptive Literature

FOX MACHINE CO.
645 Front Ave., N.W., GRAND RAPIDS, MICH.

PRYIBIL No. 5 Parallel Saw and Groover



This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

1913 Edition

"Practical Pattern Making"

A Practical Work on

The Art of Making Patterns, written by a pattern-maker with thirty years' experience. Contains information on Pattern Making and Pattern-Makers in general, also a detailed description of the necessary materials and how to use them. Then the tools, both hand tools and machine tools, with special chapters on the Lathes, the Band Saw and the Circular Saw, with many examples of work which may be done on these machines.

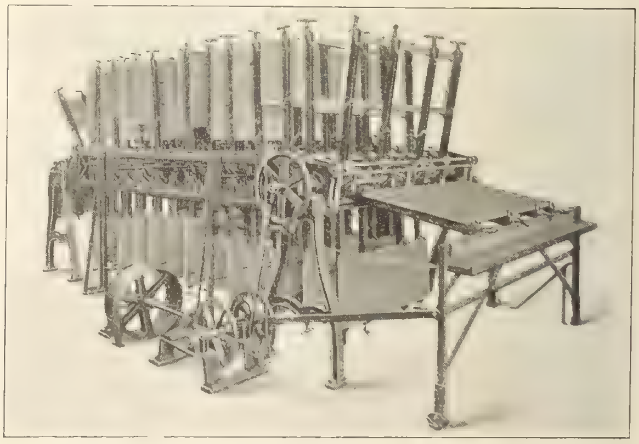
A complete section of illustrated examples of Pattern-Work in wood, with many pages of metal pattern-work, Gating and Plate work. Both Vibrator and Stripping Plates are shown. Specific instructions for plaster work are given, and finally, the cost, marking and record of patterns are explained and illustrated.

By F. W. BARROWS

Price $2.00

CANADIAN WOODWORKER
Nicholls Building, TORONTO

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

Let me tell you where you can see it in operation.

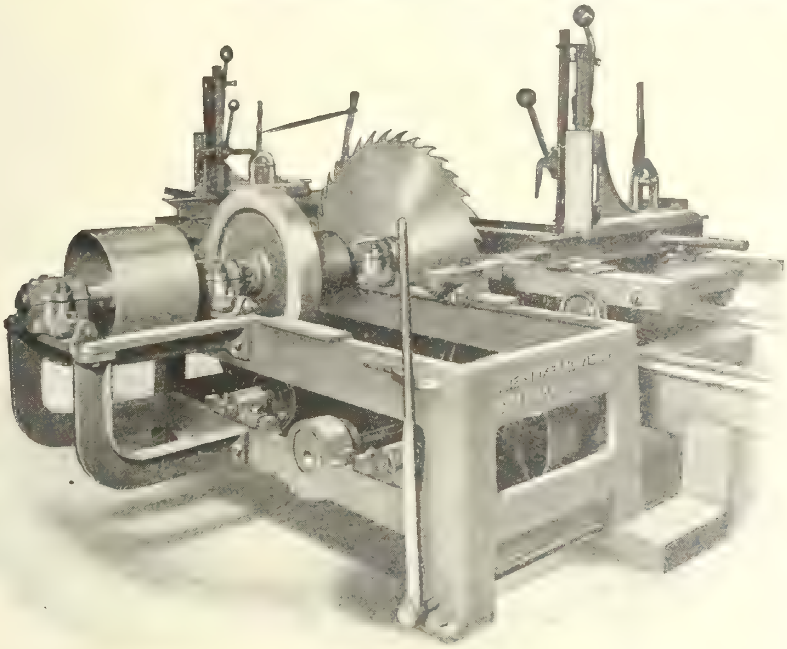
Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

The "HOOSIER" Short Log Sawing Machine

As well built as our largest mill and does as good work.



The Hoosier Short Log Sawing Machine main frame is cast in one piece, which makes it very rigid and this main frame carries the mandrel and the feed works in self oiling adjustable boxes.

On account of the frame being rigid operator can use a very thin saw. The machine is practically self contained and portable and when shipped from the factory includes the track ways and track. We build blocks and carriages to fit all requirements for handling small logs and veneer cores.

For sawing veneer cores we make our improved and grip dogs that dog the cores in the ends and hold them rigid.

For sawing logs whether straight, swell butt or crooked we make a carriage with blocks opening 24-30 and 36-in. with independent knees and Knight's pony single or duplex dogs.

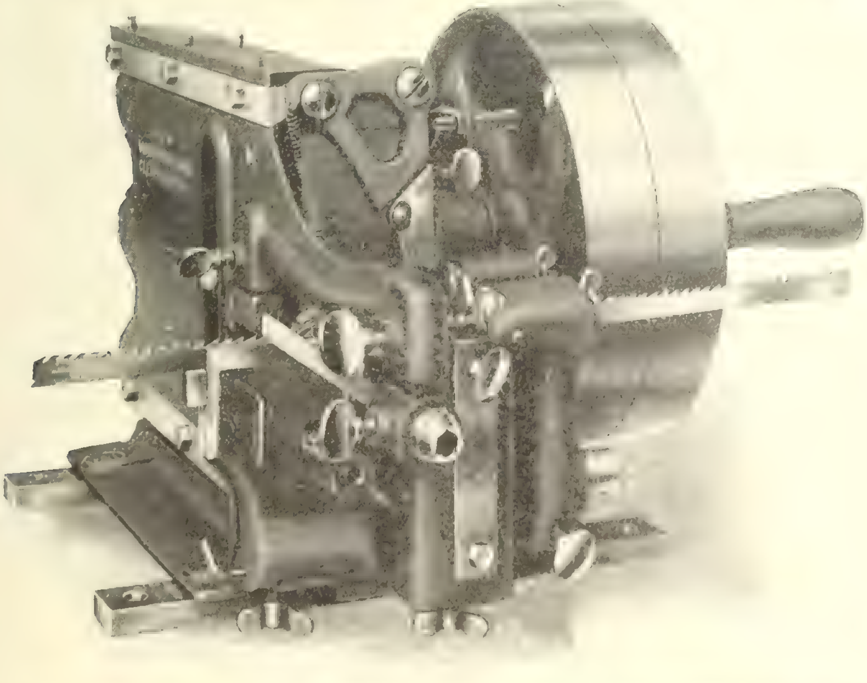
Machine will carry as large as a 54-in. saw and the machine will take care of logs up to 24-in. in diameter.

Write for further particulars regarding this machine and also regarding our New Hoosier Band Saw Mill and our new combination power and hand feed rip saw.

THE SINKER DAVIS CO. - - Indianapolis, Indiana

Manufacturers of the New "Hoosier" Band Saw Mill and All Steel Nigger Proof Head Blocks.

Files - Sets - Joints the Band Saw in One Operation



Combination Band Saw Filing, Setting and Jointing Machine for wood-working band saws ⅛ to 2 inches wide, and two to fifteen teeth to the inch, for either hand or power.

Price F.O.B. Factory, $55.00. Without setting attachment, $35.00.

Furnished with direct motor drive at special price.

2,000 wood-working shops have found that this machine will sharpen their band saws in 1/10 the time it takes by hand—and do better work.

Combination Filing and Setting Machine

files the teeth to a keen edge without leaving a particle of burr and joints them to uniform height and size, at the same time setting them any desired amount and leaving the proper clearance back of the cutting edge.

With this mechanically perfect sharpening your band saws will cut smoother, use less power and wear longer.

A well made machine with wearing parts of steel and setter points of tool steel. The filing arm works on steel slides and is free from all babbiting.

The
Wardwell Mfg. Co.
112 Hamilton Ave., Cleveland, Ohi

(Patented)

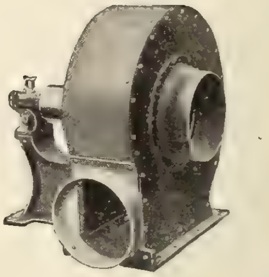
Cyclone Blow Pipe Co.

Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

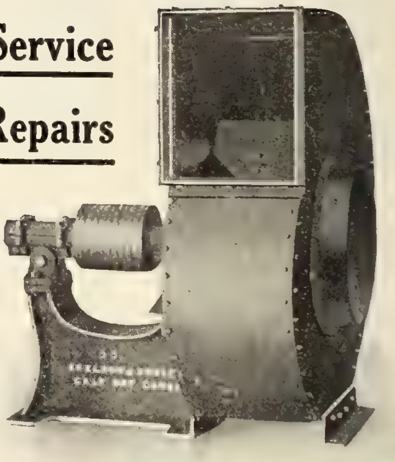
Cyclone Blow Pipe Co., Chicago, Ill.



U.S. STEEL TANK & PIPE CO
CANALPORT AVE & HALSTED ST
CHICAGO ILL U.S.A.
ENGINEERS & CONTRACTORS
FOR
SHAVINGS & DUST
EXHAUST SYSTEMS
SLOW SPEED
COLLECTORS
AND
FANS
ETC

Maximum Service

Minimum Repairs



The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs. Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

Keiths LIMITED

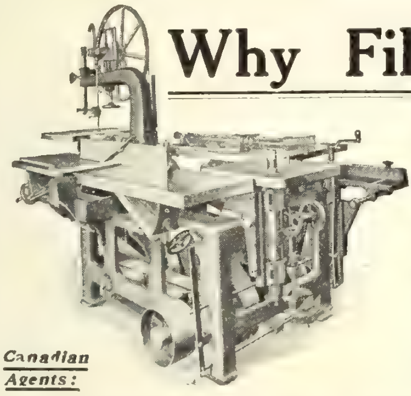
Reduce Insurance Premiums

WILL YOU LET US SEND YOU AN EXPERT FREE OF CHARGE

to show you the best investment you ever made. Many Sprinkler Systems are paying their Owners 50% per annum return on the investment in reduced insurance premiums, and in addition are affording almost perfect protection against loss by fire due to interruption of business.

111 King Street West, Toronto

Associated Automatic Fire Sprinkler



Why Fill Your Shop With Machinery?

The 1914 Model Famous "31" Universal Woodworker combines 16 machines in one and does 31 kinds of work.

Saves 50 to 100% in first cost, floor space, power, cost of installing and upkeep.

New Catalog No. 25 for 1914 tells all about the "31" and over 50 other money makers for Woodworkers. It's free.

THE SIDNEY TOOL CO., 250 Highland Ave. Sidney, Ohio, U.S.A.

Canadian Agents:
The A. R. Williams Mchy. Co., Toronto: Bournival & Co., Montreal: The A. R. Williams Mchy. Co., Winnipeg: The A. R. Williams Mchy. Co., Vancouver

BETTER RESULTS AT A BIGGER SAVING

Hundreds of Woodworking Plants are being helped to this end by

CARBORUNDUM BRAND GARNET PAPER AND CLOTH

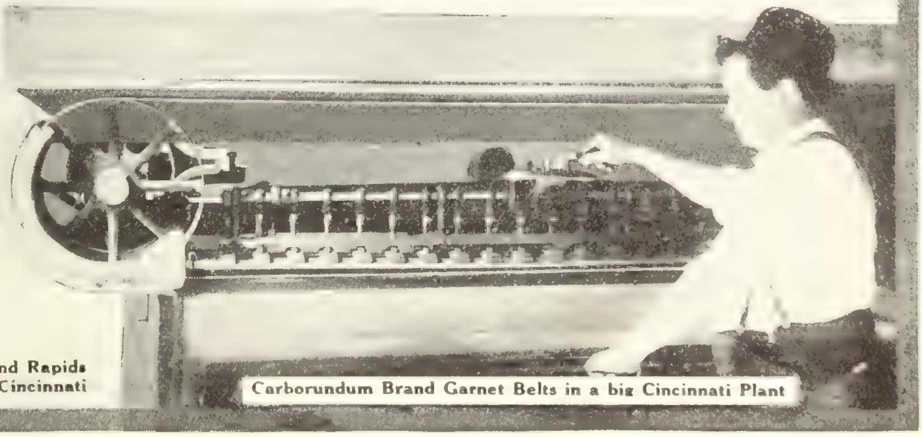
CLEAN, sharp, durable products, uniformly made of the best possible materials—fast cutting because only the hardest, sharpest, most uniformly graded Garnet grain is used in their making—they do better work in less time.

There is real sanding service in Carborundum Brand Garnet Products

The Carborundum Company

Works:
Niagara Falls, N. Y. Manchester, Eng.
Reisholz Düsseldorf, Ger.

Stores:
New York Chicago Boston Grand Rapids
Philadelphia Milwaukee Cleveland Cincinnati



Carborundum Brand Garnet Belts in a big Cincinnati Plant

MORTON MOIST AIR DRY KILN

The Most
Perfect
Dry Kiln
on the
Market

The "Morton" has a reputation for drying oak, maple, birch and beech quicker and better and with less steam than any other method—excepting none.

Write for our New Catalog "W"

Morton Dry Kiln Co., Chicago, Ill.

"Wood's Saws are Good Saws"

Fred Wood & Son

SAWS

135 Richmond St. West, TORONTO

We specialize in the manufacture and repairing of fine Circular Saws for the use of Planing Mills and Woodworking Plants.

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

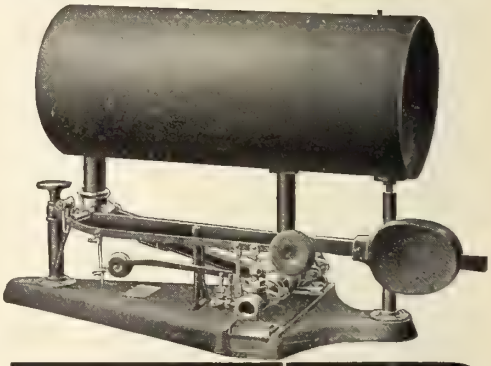
Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited
Hull, Quebec

The Morehead Back to Boiler SYSTEM

will return that water in your Steam Lines to your Boiler.



IF the amount of your steam line condensation is of any volume at all don't waste it. Send for a "Trial Trap" and see how quickly the Morehead System will show savings in your coal bills, repair expenses, etc., not to mention the great improvement in your heating system.

From 20 to 40 per cent. of the heat units in the water of condensation is lost by cooling the condensation down to accommodate a steam pump.

Morehead Traps return the condensation with its full heat content direct to your boiler with practically no drop in temperature.

MOREHEAD TRAPS are being used everywhere on Heating, Drying and Cooking propositions of every kind, from straight pipe work to fan stacks and under vacuum conditions without regard to the difference in pressures between the apparatus drained and that carried on the boiler and without regard to the location of the apparatus drained, whether above or below the water line in the boiler.

There is a Morehead Trap for any kind of service. Just state your conditions and we will send you a Trap for free trial.

DEALERS AND AGENTS: The Morehead System appeals instantly to users of steam. If you are in territory not already covered the opportunity to secure this valuable agency should not be overlooked. Application of responsible dealers in unoccupied territory will be given immediate attention.

CANADIAN MOREHEAD MANUFACTURING CO. Ltd., Woodstock, Ont.

Canadian Representatives: George W. Cole, Woodstock, Ont.; Robert S. Bickle, Winnipeg, Man.; H. E. Kirkham, Montreal, Que.
Robert Hamilton, Vancouver B. C.

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring,
woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.

Nicholls Building, Toronto
Phone Ade. 929

Vol. 15 February, 1914 No. 2

Safety Devices for Woodworking Machinery

HAVING regard to the legislation affecting workmen's compensation which has been engaging the attention of employers so much of late, it may be opportune to draw attention to the article in this issue of the "Canadian Woodworker" which deals with safety devices for woodworking machinery. Although employers as a body are desirous of taking every reasonable precaution for the safety of their workers, yet there is no unanimity of agreement on the subject of insurance against accident. The pressure of modern conditions, both inside and outside the workshop, taken in conjunction with the up-to-date machinery in use, render the chances of immunity from accident a great deal less to-day than at any other period. When it is considered that Canada reports a yearly average of thirteen hundred fatal accidents to industrial workers, a much more numerous total of accidents resulting in permanent injury, and a still greater proportion resulting in temporary disability, the full import of the question as it affects the employer of industrial labor is at once apparent. It is stated that in anticipation of the passage into law of the Workmen's Compensation bill, contractors in the building trades are taking greater precautions than heretofore in the way of protecting their employees against personal injury. No doubt employers in woodworking industries will consider it advisable to equip their machinery with safety devices to a greater extent in the future than in the past. There are many woodworking machines, the most prominent of which are illustrated in our article, that expose the operator to unnecessary risk, whereas by the adoption of some simple expedient in the way of guards the possibility of accident would be reduced to a minimum. A study of the article referred to will impart much information in this connection that should be found useful to employers in considering the best means of securing modern protective contrivances.

Piling Lumber in Relation to Drying

SOME good practical points on the drying of lumber are brought out in the article by H. D. Tiemann, published elsewhere in this issue. The fundamental principles governing this important operation are enumerated, as are the advantages of really up-to-date kiln drying. The article serves as a reminder of the fact that the circulation of air is too often retarded under the prevailing methods of piling. Not only are the air spaces choked up, but frequently the piles are covered with a practically air-proof roof. Perhaps the main idea to keep in mind is that it is the centre of the pile that is to be dried and that consequently the lumber should be piled in such a manner that plenty of air is circulated in the centre. Edge piling is the most effective and side pitch piling comes next. Trucks should be lengthwise of the pile. By this method a perfect foundation is furnished and the bottom of the pile will be as straight as the supporting rails. It has been pointed out that with the present practice of pitching the pile lengthwise, the sawdust and dirt gradually move down to the stickers and lodge there, forming a damp mass in the angle of the sticker and the board. This is the origin of sticker rot and stain. Free circulation of air is the secret of success in this operation, and the piling is everything. Perhaps some of the readers of the Canadian Woodworker may be able to bring forward some interesting observations from their experience in this connection.

Educational Value of Furniture Shows

THE furniture manufacturers of Ontario are entitled to commendation on the successful outcome of the three exhibitions held recently at Berlin, Stratford and Toronto. These exhibitions possess a high educative value from many viewpoints. From the commercial standpoint the retailer is afforded the opportunity of judging the latest lines in furniture-making and of seeing at first hand what the manufacturer is capable of producing. Also he finds ample scope to study the enormous advance which the industry has made in the last few years. These advantages to the retailer who desires to keep abreast of the times are too obvious to require emphasizing. Then again, from the point of view of the practical woodworker, there is a great deal to be learned from a careful study of the new suites in period and other furniture. In this respect a great advance has been made by many manufacturers along styles such as the Colonial, Jacobean, Elizabethan, Sheraton, Louis XVI. and others. With the rapid advance in general culture so prevalent a feature of our time we are steadily developing an increased tendency to comfort and refinement. This tendency reveals itself to a great extent in furniture, the natural outlet being the desire to obtain examples of the best styles. In fact period styles are fast coming to the front, as was evidenced unmistakably at the recent exhibitions, where some of the finest specimens of furniture in Canada were seen. From this it will be realized that the educative value of trade exhibitions cannot be over-estimated. At such a time as this, visitors who are anxious to know something of the practical side of the industry avail themselves of the privilege to discuss with the manufacturers the various processes of furniture-making and also to inspect the factories and see the work done at first hand.

We were glad to notice the exhibition of many new lines of furniture this year and particularly the new line in suites. These included period furniture, in mahogany and oak, for dining and bedrooms, a fine example of a mahogany Chinese Chippendale dining-room suite being most attractive in its elaborate carving. An exhibit of bedroom furniture, inlaid in holly and satinwood quartered gum, was a new line which attracted a good deal of attention. In each of the exhibitions period furniture was very creditably represented, whilst several new lines in office furniture commanded the attention of visitors generally. It is of the greatest importance that the consuming public should be educated in regard to Canadian-made furniture. The Exhibitions of 1914 possessed numerous educative features and we hope that their value will be recognized to a much greater extent in the future by those interested in the furniture and woodworking trades.

Typical Examples of Period Furniture

Staff article by S. Bothwell.

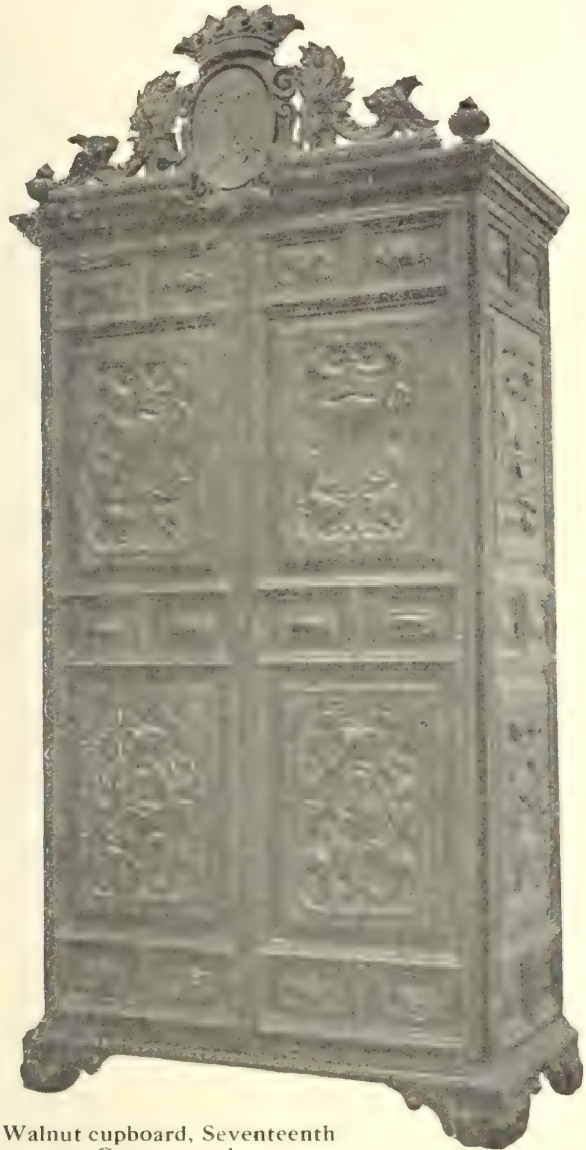
PERIOD furniture, considered either in the collection of typical examples of sixteenth and early seventeenth century styles, or in the manufacture of their counterpart in some of the leading furniture factories of Ontario, is developing rapidly in many directions. In our issue for December, 1913, an article appeared relating to the collection at present being acquired in the Royal Ontario Museum of Archaeology. No doubt there are to-day many excellent collections of period furniture in the homes of Canada, many valuable pieces which might with advantage be copied, taking into account the ease with which some of these types could be adapted to present day requirements. Our object in this article is to draw the attention of readers of the Canadian Woodworker to a few carefully-selected examples of furniture which find a place in the home of a private collector. The types here reproduced are typical of the period to which they belong, a prominent feature being the elaborate carving and massive construction which characterized much of the furniture of those days.

Probably no piece of oak furniture which has descended from our forefathers is so universally owned and used as the early oak chest or coffer. In almost every sale of farm or cottage furniture in the less sophisticated country districts of Europe, one or more of these chests are to be found. They vary from elaborately carved specimens to examples with plain stiles and panels, but whether carved or not they are as useful as they were at any former period. So it happens that in many instances a collection of old oak furniture has begun with a nucleus of an oak chest, because the housewife, whatever her opinion may be of its artistic merits, can find for it some definite use; and in such an instance, therefore, the presence in the home of a chest or coffer combines general utility with artistic beauty.

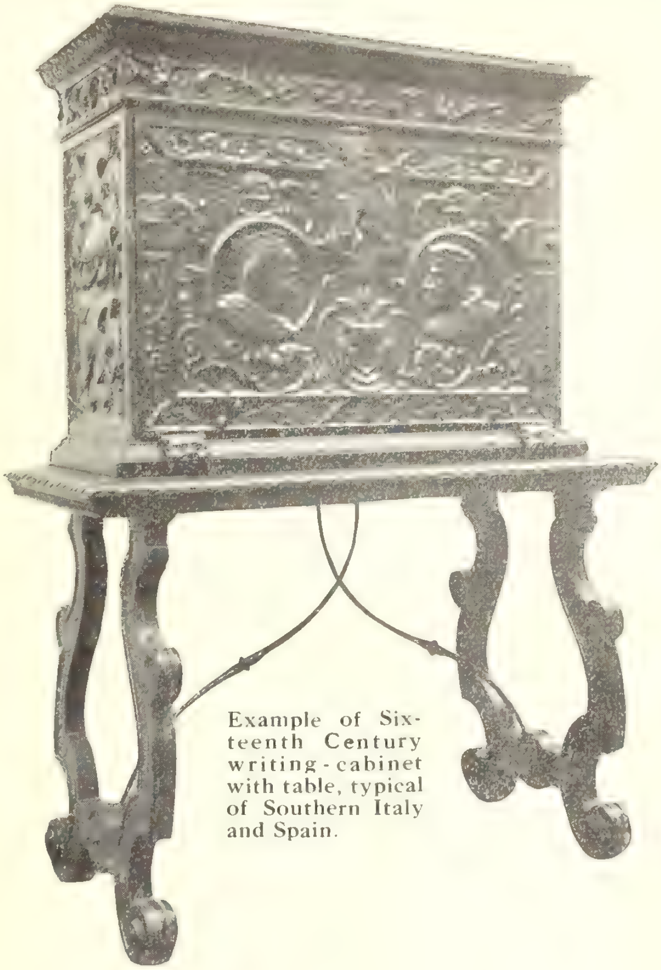
The type of cupboard illustrated in Fig. 1 is seventeenth century. The elaborate panelling and richly carved work, particularly on the doors and top, render the piece unique. In studying the different types of chest it is interesting to learn that simple as is the shape of the chest there is much in the principle and working out of details in a good example that is worthy of attention, the attractiveness of the genuine color of old oak being so different from the blackish stain of the imitation. The relative merits of smooth panel work, the beading of the stiles, the great question of the extent of decoration—whether it is better that the stiles be plain and the panels carved or the reverse; whether both framework and panelling may be floridly adorned, the advantages and disadvantages of inlay upon oak—all these matters may be considered as well in the case of an oak chest as in a cabinet. While the latter is a comparative rarity there are still many examples of chests of seventeenth century, if not earlier date, to be found. The continuity of style between early and later chests is shown in France where are to be found chests of the fifteenth and early sixteenth centuries. In some cases coats-of-arms and heraldic devices are the central ornaments of the tracery; in others portraits of ecclesiastics, both styles occasionally being found in the same chest.

In the Elizabethan period there is no longer so great a rarity of existing objects of furniture and woodwork. It is true that we still and shall always be hampered by an inability to name the designer and maker of this or that particular example. The historian of French furniture is more fortunate in that respect, in at least one period, and that perhaps the most interesting of all. The law by which the maker, after the year 1757, was required to stamp his name upon his work has been of the greatest value, and we cannot but regret that the practice has not been general in all countries and at all periods. The writing cabinet shown in Fig. 2 would appear to be characteristic of Southern Italy and Spain, being a sixteenth century type. This style of cabinet came into very great favor during the latter part of Queen Elizabeth's time, nothing being spared in the effort to make the furniture of that time as elaborate as possible. Hence the beautiful woods in which some of the best types were manufactured, including ebony, which was occasionally used. The twisted iron supports, noticeable in this illustration, are characteristic of Spain and Southern Italy.

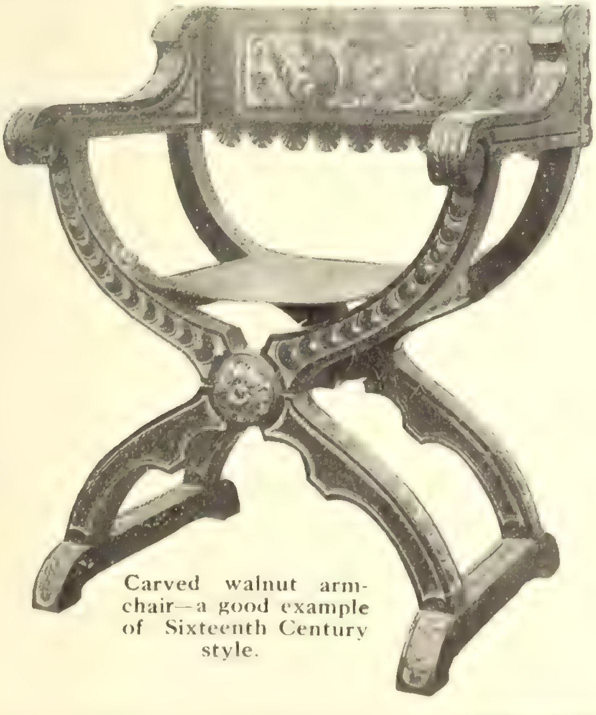
The reign of William the Third marks an important change in the design and construction of the chair. Turned work gives way to flatter forms, especially in the uprights to the back, in relation to the chairs of the late seventeenth and early eighteenth centuries. One inference to be drawn is that the passing of the cross rails between the legs in favor of the curved or cabriole leg is that manners were becoming more refined and chairs suffered less from rough usage than they did in the oak period. Another is that with the introduction of mahogany it was possible to make finer and stronger joints. The chair shown in Fig. 3 is a good example of sixteenth century style. It came



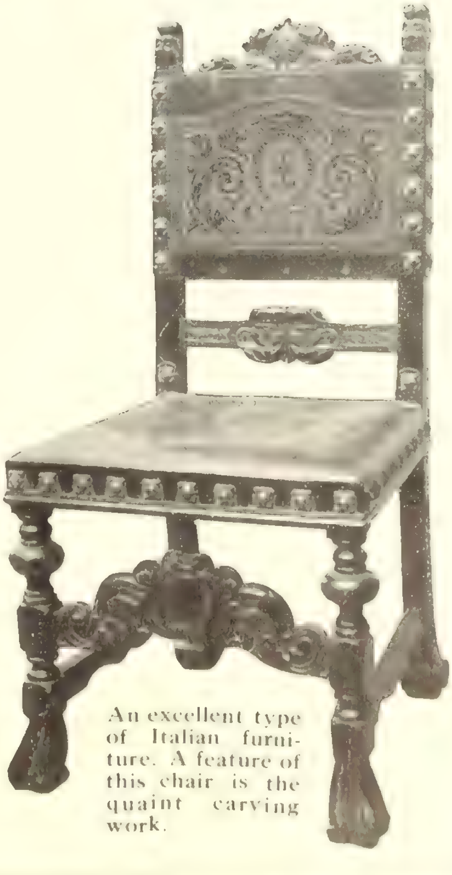
Walnut cupboard, Seventeenth Century style.



Example of Sixteenth Century writing-cabinet with table, typical of Southern Italy and Spain.



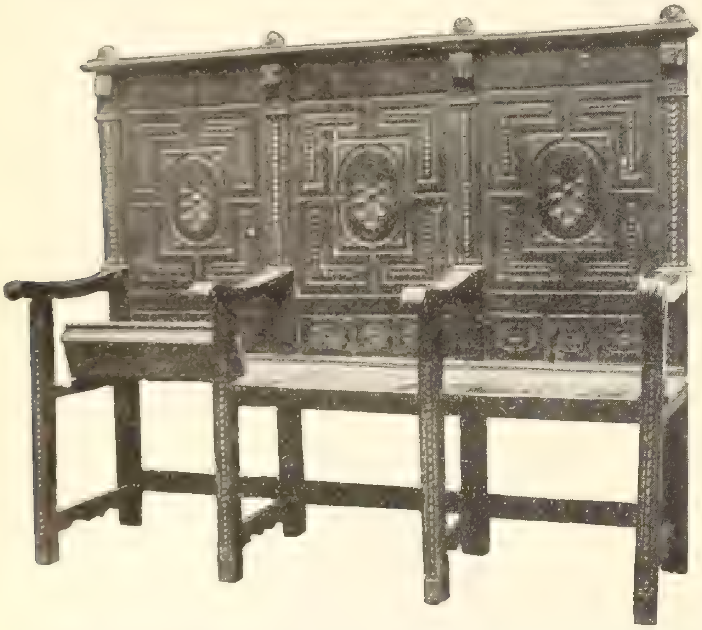
Carved walnut armchair—a good example of Sixteenth Century style.



An excellent type of Italian furniture. A feature of this chair is the quaint carving work.

into fashion in England very largely in the time of Henry the Eighth, and quickly gained in popularity by reason of its excellent wearing qualities. It is of walnut with brown, gilt, and colored Cordova-like leather seat and back. A feature of the chairs of this period were the shallow seats, which to-day would appear very ludicrous indeed. The chair seen in this illustration is a development of the camp stool, being made to close up. It is a most comfortable type of chair, is easily made, and would appear to be gaining in popularity. In the early part of the eighteenth century an advanced type of boudoir chair came along and rapidly made its way into the dining room. This type was commonly upholstered with satin and made light and dainty to conform with the ideas of the period.

Illustration No. 4 shows a good type of Italian furniture with its elaborate and ornamental carving. It was in the seventeenth century that the cane bottom was introduced into England from the East Indies by the Dutch. The elaborate upholstering which is here seen is typical of the furniture in the time of William and Mary. Variations of this elaboration were introduced from time to time subsequently, but the heavy bar in front was an introduction of an earlier period when heavy elaborately carved furniture was the mode. The example of a carved walnut choir seat, seen in Fig. 5, is probably Italian judging from the rich panelling which is so marked a feature of the piece. It is said to have been taken from an old church in the north of Spain. It will be observed that part of the seat can be raised at will.



This example of walnut choir-seat is presumably Italian, judging from the panelling. It is said to have been taken from an old church in the north of Spain.

Chairs did not come into common use until the sixteenth century. With regard to chests the earliest types we have remaining were made for ecclesiastical purposes, and a few are still to be found in the parish churches of England, for which they were originally constructed. The Gothic periods to which they belong are undoubtedly those of the finest productions in oak carving. It seems pretty certain, however, that as the seventeenth century progressed the severer feeling of the English nation threw off much that seemed florid. The Jacobean and later carvers appear to have contented themselves with a few well-tried patterns of the English oak. A remarkable effect on the furniture of the seventeenth century was produced by Grinling Gibbons, so much so that there is probably no instance of a man before Gibbons who showed such an astonishing power of intricate combination as a carver. With all his naturalism he had an underlying groundwork of well-balanced constructive lines. Gibbons died in 1720, just before the period of mahogany furniture is said to have commenced.

When we come to consider period furniture as a whole, we find that Chippendale had one unvarying method of treatment for a splatted open-backed chair, wherein he differs from his great successor Sheraton. It is probable that Chippendale's earliest affections were centred upon the styles of Louis the Fourteenth and Louis the Fifteenth. There is little in the massive dignity of the earlier king's style. It is to be observed in the terminal-shaped legs of cabinets and sideboards, and occasionally in alternative patterns for chair legs. The chief distinction which marks Sheraton's sideboards is the use of a brass railing at the back. The happiest combinations of the artistic with the mechanical are found in Sheraton's library and bed-room furniture, some of the former of which is designed mainly for usefulness as in the case of his tables and library sets.

Revival of Walnut as Furniture Lumber

THIS season has brought a considerable revival in American black walnut for furniture purposes. A generation ago walnut was almost the only cabinet wood in common use. The growing scarcity and high prices compelled the manufacturers to find some other material and oak was developed as its successor. To-day walnut is little more than a tradition in trade circles.

It will be found in some of the old homes and in attics and in the furnishings of some of the ancient cross roads hotels, but it has little place in the modern residence. In the old days walnut was used with little discrimination. In the present revival care is taken that the design of the furniture makes it suitable and appropriate. It is effective in the French patterns, in some of the colonials and in the early English periods. In the old days little attention was given to other finish than to darken the wood and apply the varnish. In the modern application the finish is the natural color, or at most only slightly darkened and then other woods are used in combination with it to afford contrast.

A very effective trim is ebony and in some instances ebony and walnut burl are used. In the old days walnut was used almost exclusively for dining room and library goods, the dark rich color making it appropriate. It is unlikely the revival of walnut will be very extensive, for the wood is still scarce and in price almost ranks with mahogany.

Mahogany and Oak Still Leaders

Mahogany and oak are easily the leaders in furniture woods. These are not used indiscriminately but the wood is chosen to fit the design. The Sheraton, Chippendale, Hepplewhite, Adams and similar designs are invariably in mahogany for it was in this wood that the old masters did their work. The early English period goods are in oak. The straight line stuff is mostly in oak, although occasionally seen in mahogany. Mahogany is the chosen material for most of the colonials. The modern manufacturer has learned that design and material must be in harmony and this is something the manufacturers of the past generation either did not understand or ignored.

Very little of what is known as tuna mahogany is seen in the market these days. Tuna is the mahogany in its natural color and in this form the beautiful figure of the wood is best shown. The natural color, however, is too light and too loud to be popular and modern taste demands that it shall be darkened and made antique. In some patterns it is rubbed to produce a used effect. Oak in the natural color is even more rare than tuna mahogany. It is fumed, stained, bleached and in various other ways treated to bring out desired color or figure effects. What is known as golden oak is still popular with the borax trade.

Circassian walnut has had a prosperous run of several years in high-grade goods but there are signs that its popularity is waning. The wood is from Syria and is used almost exclusively as veneers. It is limited in supply, high in price and there is much waste in cutting. The veneer has a very striking figure and neutral colors that do not clash with other furnishings, but buyers complain that they become tired of it in time. Circassian has been confined chiefly to bedroom goods and specialties.

American red gum has had a great growth in popular favor in recent years. It was once a despised wood and regarded by manufacturers as hard to manage owing to its warping proclivities. The growing scarcity of the oak has driven them to study how to handle the material and they have succeeded. It goes into the cheaper grades mostly but is rapidly finding favor in the medium and appears occasionally in the high class. In the better grades of furniture quarter-sawed and figured stock is used. In the natural finish the wood is not very striking but readily takes stains and finishes when special effects are desired. It makes one of the best imitations of mahogany, and the figured veneers serve as good imitation Circassian walnut. It is the favorite material for making the solid parts in Circassian furniture, stained to the walnut color.

Birdseye maple is considerably used in medium and cheap goods, chiefly for the bedroom. It is also used in high-grade parlor or living room furniture, but when so used is treated to give it a rich brown color or golden tint. The finish emphasizes the beautiful figure and harmonizes with other furnishings while the natural white grows yellow in time and is inclined to be murderous to other furniture.

Enamel furniture has become immensely popular in recent years and is shown in practically all the grades from the cheapest to the highest price. The cheap enamel may be little more than a couple of coats of paint. The high-grade means eight to ten coats with rubbing between coats and months to complete. The enamels are in practically all colors, with white, ivory and gray the most popular. The enamel goods are mostly for the bedroom but living room and parlor pieces are also shown. The enamels are used only on such patterns that are appropriate and are especially effective in the French designs. In recent years there has been an increased use of cane as panels in beds. It is effective in combination either with mahogany, Circassian walnut, oak and enamel, the design determining its appropriateness and the finish harmonizing it with the wood.

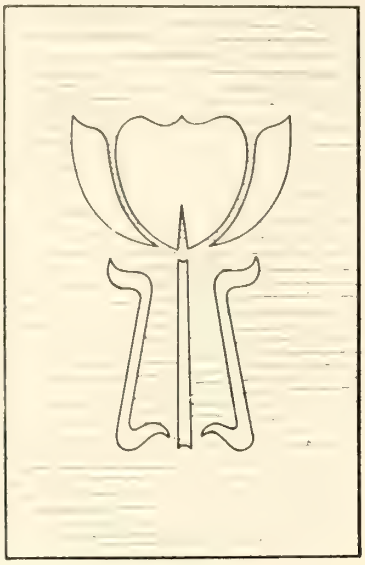
Practical Hints in the Art of Marquetry

Contributed by R. W. Hall, Toronto

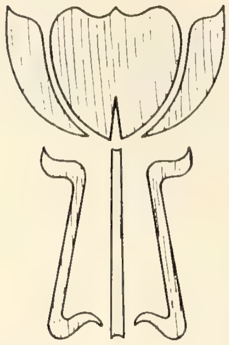
THE art of inlaying together several pieces of wood or veneer so as to form an ornament or design in some place where it may be seen to advantage, is the desire of quite a number of our up-to-date craftsmen in the woodworking industries. Occasionally we find a cabinet maker or a carpenter who devotes his time and energy to this fascinating study, and in this way many beautiful pieces of work have been executed. The writer has been acquainted with woodworkers who in their spare moments have executed very fine work on geometrical lines forming pretty mosaic designs; nor is it uncommon for some of these mechanics to use veneers similar to those used by the cabinet maker in the manufacture of furniture. Others again there are who follow out their design a quarter of an inch thick, thereby enabling them to secure a finished surface without going through. There are several classes of marquetry, each of which has its turn in popularity. These may come in and go out, but as a rule they return in a new phase after a while.

We have had the black and white marquetry while nothing else was used except shading in some instances; then we have a little metal introduced, such as pewter, copper, brass, etc.; then again, we get a turn of the high colors, together with the introduction of tortoise shell. Coming closer to the present time we have got into a variety of beautiful tints artistically blended together in the most elaborate designs. Not satisfied with this superb stage, however, we introduced a sprinkling of the beautiful Japanese mother o'pearl with fascinating effect.

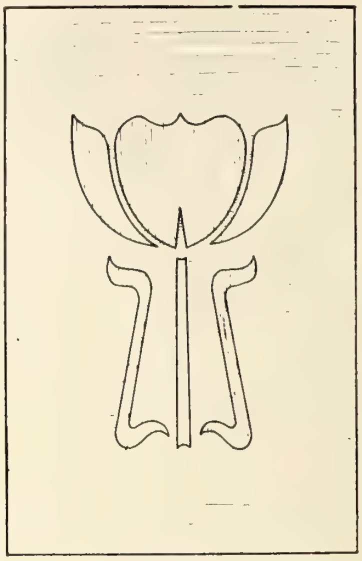
Reverting to the friend of our acquaintance who desires to have the instructions necessary to equip himself that he may get abreast of his craft by making his own inlays instead of purchasing, thereby utilizing some of his waste material which would otherwise be consumed in smoke, as our first example we take the tulip. Draw on a clean sheet of paper the desired object, leaving out parts of the stem so that the stem blades and petals are all separate and distinct. Having got the design to your satisfaction, take another sheet of paper and place it underneath the first, pin them to a drawing board then with a tracing wheel run over the lines and perforate the two sheets. Then draw a design on the under sheet also. Another method is by placing a sheet of carbon paper between the white ones, and drawing over the design on top. Next prepare the grounds into which you intend to place the inlays—say four pieces of veneer a few inches larger both ways than the design, so as to form a clear margin round the ornament. These pieces are generally fixed by means of fine pins, one at each corner near the edges, so that ultimately they will be cut off. A method I would advocate is to glue small pieces of paper on the corners of the grounds, then glue the lot together. At this stage the design may also be glued on to the top veneer, taking the precaution to place a piece of paper on top to preserve it. The whole block



Grounds cut out.



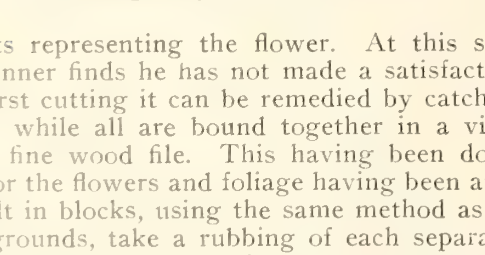
Stem blades and petals ready for insertion.



Grounds filled in.

PRACTICAL HINTS IN THE ART OF MARQUETRY

should be put into a letterpress for a short time to convey equal pressure and keep them flat. The stem, blades and petals are now ready for boring. Bore a small hole sufficient to allow the saw to pass through. It is of little use attempting this work by hand. (The writer uses a Hobbies Imperial treadle fretsaw with boring attachment). Pass the saw through the hole, fasten in clamps, and adjust so that it is running perfectly perpendicular, having previously tested the table so that both table and saw blade are at right angles. Set the machine in motion and see that everything is running smoothly, then follow the lines gently, not giving too much pressure but allowing the saw to work smoothly and cut out the whole of the parts representing the flower. At this stage, if the beginner finds he has not made a satisfactory job of his first cutting it can be remedied by catching the grounds while all are bound together in a vice, and using a fine wood file. This having been done, the colors for the flowers and foliage having been arranged and built in blocks, using the same method as in that of the grounds, take a rubbing of each separate hole cut in the grounds and fix in same manner as before, only observing to keep exactly on outside of lines so that in the event of a repetition of inefficient cutting they may be trued up before being taken apart. Having fitted the several parts so that they may be pressed into their places without splitting, they may now be separated and glued into the grounds. With a coating of thin glue put a piece of paper right over the flower in order to hold all the parts together, and having repeated this place them in the press overnight, after which they may be taken out and scraped on the unpapered side and teethed with a fine teething plane. They will now be ready for laying, which process will be treated in a future article.



An interesting study for the marquetry worker.

For the beginner another exercise possessing a little more difficulty, as the lines are closer and consequently easier broken, is that of the bird portrayed in the illustration in a flying position. If gone about with average care the difficulty may be easily overcome. By building the veneers with the paper the full size of the inlay, this will make the block more solid, and as this paper is invariably used between the veneers, they split easily and little remains to be scraped off at the finish.

First cut the outline all round, then cut in with the saw the division of the feathers in the tail, wings, and beak; next cut off the wings, and if desirable the tail in a ziz-zag manner which may be slightly shaded as well as the shoulder of the wings and top of head. To form the eye a fine hole may be bored and filled in with black material, and a shaving to fit the saw-cut may be inserted in the beak, wings, and tail. A nice overturn may also be made on the forewing. Now fit one neatly together, then with a sharp pencil draw the outline of this one on the grounds, cut out and fit the others right into their places, glue them and paper as before, press, scrape and teeth as already mentioned.

(To be continued.)

One reason why efficient expert propositions are often unpopular with the men who do the work is that the average efficiency engineer is planning primarily for more profits for the institution rather than more pay roll for the men who work. It is natural for him to do this, but it is equally natural for the men to dislike and to often strenuously oppose ideas and changes proposed. A little more altruistic humanity would make them look better and take better.

Features of Toronto Furniture Display

Noteworthy Innovations in Design Shown by Ontario Manufacturers at Successful Furniture Exhibition held in the Queen City.

MUCH of interest to woodworkers was to be seen in the furniture display made by Toronto manufacturers in the Horticultural and Transportation buildings of the Canadian National Exhibition Association from January 12 to 24. The exhibits of about fifty exhibitors were displayed in pleasing fashion along the show rooms, the whole constituting a creditable exhibition of woodworking products. Such indeed has been the success attending the initial venture of the Toronto manufacturers that the event is likely to become a permanent one after the fashion of Berlin and Stratford. An idea of the varied character of the display will be gathered from the appended description of the principal styles of furniture on exhibition.

The Collier-Cockerill Company, Limited, Aurora, Ont.

As manufacturers of office furniture this company occupy a leading place in the furniture trade. Their line of desks and office furniture are unsurpassed in both design and finish, a feature of the desks being compactness, convenience and equipment with or without letter filing and card system devices. Their office furniture includes everything necessary for equipment, such as high desks for bookkeepers, typewriter desks, filing devices, etc., which are furnished in quartered-oak or mahogany, to suit the purchaser. The factory make a rule of using none but the best material in their factory, which insures solid workmanship throughout, with the result that they have a combination which it would be difficult to excel. Extension is in the air and the firm intend to manufacture a complete line of office furniture requirements. The woods used in the samples shown were mahogany and oak.

Toronto Furniture Company, Limited, Toronto

An exhibit which was creditable alike to the furniture trade and the exhibitors, was that of the Toronto Furniture Company, Limited, which was displayed in their factory show rooms, Dufferin Street. They are manufacturers of dining-room, library and chamber suites and odd pieces in mahogany, Circassian walnut and oak. The firm carry a fine line of the best period furniture, to which their factory is devoted exclusively. It is recognized as the standard for up-to-dateness in the woodworking trade. In the manufacture of the furniture method and thoroughness are combined, with the result that from the roughing-out of the piece to the finished article everything is carried through with method and judgment. The firm is specializing this year in suites in the Adams, Colonial and Queen Anne periods, and the specimens of dining and bed-room suites in solid mahogany and walnut would certainly be hard to beat. The firm also do enamelled work, the quality of which is attested by the fact that their staff is one of the most efficient in the trade.

The Knechtel Furniture Company, Limited, Hanover, Ont.

This firm specializes in sectional bookcases made with sliding drawers. The main points about this bookcase are its capacity for reduction to a very small space by means of a patent arrangement adopted by the firm. The Weis [illegible] cabinets are also made by this firm and can be shipped completely knocked down from a seven-foot stack to a space of eighteen inches, thereby effecting a saving in freight and avoiding any chance of breakage. A feature of this cabinet is the sliding back and sliding top, and the cabinet is also made with the receding drawer. The firm have twenty-seven different lines in kitchen cabinets, a feature of which is the cooling cabinet. In their five factories they turn out all kinds of case goods, chairs, upholstered furniture, desks, etc. The woods principally used are oak, mahogany, and in finishes golden oak, fumed oak, satin walnut and enamel. Some new finishes introduced are maple and walnut and birdseye.

Meaford Manufacture Company, Limited, Meaford

This firms' line is in the manufacture of all classes of household furniture with the exception of chairs. Catering as they do for the buyer of medium priced goods, they specialize in surfaced oak and mahogany, also enamelled. The firm have recently introduced a line in early English wardrobes with combination cabinets. Their kitchen cabinets are all finished in maple in such manner that they have the appearance of oak, the same workmanship being put into them as if solid oak were used. The firm are well-known as manufacturers of side-boards, buffets, centre tables, pedestals, etc., in surface oak and imitation mahogany.

H. E. Furniture Company, Limited, Milverton

This company manufactures kitchen cabinets on an extensive scale, their idea being to bring out designs that will afford the maximum of convenience in the kitchen. Their detachable flour bin is a new departure in this cabinet, also their drop curtain front which dispenses with the necessity for doors. Other features are the extension top running rollers, sliding shelves and sanitary sugar bin on a swinging bracket. In the manufacture of these cabinets gum and oak is used, and the interior is done in enamel, which with the usual finish makes a handsome article of furniture.

Malcolm and Souter Furniture Company, Hamilton

This company's output comprises bedroom furniture in Circassian walnut, mahogany, quartered oak and gum; parlor and library tables, writing desks, cabinets and wardrobes. The enamelled line in ivory, white and French grey was very noticeable, as also was the suite in ten pieces of Circassian walnut. A new line in suites was a curly birch in natural finish, and of the newer styles of mahogany suites those treated in cane panel effects were very attractive as showing high-class workmanship. Amongst the samples of quartered gum work were two pieces inlaid in holly and satinwood which were perhaps unique.

F. E. Coombe Furniture Company, Kincardine

This firm displayed some excellent samples of their wood work, which includes Jacobean inlaid suites in fumed finish, with cane-seated chairs and backs, also mission furniture. Tables in many shapes, patterns and designs of the mission line were on view, the office chair specialty comprising all kinds of chairs and stools for business offices. Other exhibitors specializing in chairs included the North American Bent Chair Company, Owen Sound; the Owen Sound Chair Company; Elmira Furniture Company, and Schierholtz Furniture Company, New Hamburg.

Andrew Malcolm Furniture Company, Kincardine

Some fine examples of period furniture in [illegible] Elizabethan, Adams, Sheraton and Colonial styles were shown in mahogany and oak for dining and bedrooms. A birds-eye maple bedroom suite, several specimens of mahogany, Circassian and ivory enamel, were amongst the [illegible] attracted most attention. The inlaid work in library mission suites done by this firm in fumed finish is equal to any other in the country.

Hespeler Furniture Company

This firm are well known makers of period suites in Colonial, Jacobean, Elizabethan, Sheraton, and Adams styles. Bedroom and diningroom suites representative of these periods were shown, amongst which a bedroom suite inlaid with oak, and other suites in fumed oak, built on modern lines were very attractive. The woods principally used in the factory are mahogany, oak and Circassian walnut, and the finishes fumed, dull and polished.

Gold Medal Furniture Manufacturing Company

Some of the Gold Medal new features were two-piece suites—davenports and chairs to match. In parlor and drawing-room furniture some excellent mahogany frames were shown, an upholstered suite of Louis XV. design being very attractive. Individual chairs and rockers in leather and tapestry; couches, Morris chairs, in leather and velours; easy and rocking chairs, in fumed and oak, all formed quite an interesting collection.

Morlock Bros., Limited, Hanover, Ont.

The above firm displayed three and five-piece parlor suites, made in various designs and upholstered in tapestries, silks and leather. Inlaid work is a feature to which the firm pay particular attention. The several specimens of flowered inlaid parlor suites indicated that workmanship at the factory is of the best type.

Universal Cabinet Company, Chatham, Ont.

As makers of kitchen cabinets this firm showed their numbers six and seven sanitary cabinets, equipped with two spacious drawers, one of which contains compartments, cutting board, sliding shelf, and a sliding table top that will not rust, being covered with aluminum. The number six pattern has in addition two sliding shelves, door rack, and two large cupboards, the whole making an interesting exhibit.

J. C. Mundell & Company, Elora, Ont.

This firm manufacture living-room, den, library and dining-room furniture. A full library suite of Jacobean design which this firm is popularizing is one of the finest specimens of their output. They are also carrying a number of new mission designs, as also in the lower-priced lines of imitation leather goods. The woods chiefly used are quartered oak, solid mahogany and birch, and in finishes fumed and golden oak and enamel. The Elora Furniture Company, as they are familiarly known, are certainly one of the most up-to-date firms in the trade.

Hepworth Manufacturing Company

The Hepworth Manufacturing Company make a lot of bedroom and diningroom furniture in surface oak and imitation mahogany. These include kitchen cabinets, buffets, square extension tables, kitchen cupboards and diningroom sideboards and folding leaf kitchen tables. In bedroom furniture were displayed some imitation mahogany suites, bureaus and ladies' desks.

McGill Chair Company, Cornwall

Chairs of all kinds, oak and mahogany all-wood rockers, kitchen and diners, and also bedroom chairs in all-wood occupied a prominent place in the exhibit. In upholstered chairs a few were displayed in fumed and surface oak patterns in leather. Office and desk chairs and stools, from the plain oak to the upholstered revolving and tilting makes, were also well represented in the collection.

Crown Furniture Company, Limited, Preston, Ont.

The display of the Crown Furniture Company, Preston, included beautiful examples of parlor and dining-room inlaid furniture in Adams, Jacobean and Elizabethan styles. The firm also carry fine ivory finished sets, Colonial mahogany sets, Circassian walnut, Sheraton, inlaid Birdseye maple, while an excellent set in bedroom furniture in mahogany was also shown.

Markdale Furniture Company, Limited

A range of this company's lines included case goods and surface oak, imitation mahogany and white enamel. An excellent line of buffets and combination cabinets and buffets was shown, also combination desk and book cases in varying designs.

"The Most Abused Cabinet Wood—Gum"

"Suggestions Regarding the Manufacture and Kiln-Drying of Gum" is the title of an interesting booklet received from Messrs. G. H. Evans Lumber Company, Chattanooga, Tenn., which gives useful information appertaining to what is described in the foreword as "the most abused cabinet wood in America's forests—gum." A reading of the pamphlet is of such a practically informative character that we have pleasure in giving our readers the following copious extract:—

As a cabinet wood, Sweet Gum is just being introduced to the trade and by using as much care in the treatment of this wood as is used in the case of Quartered Oak, one can obtain the same high degree of finish and workmanship.

Here are a few points of interest:

(1) The logs should be cut from mature trees.

(2) Logs should be cut in the fall after the sap has gone down out of the body of the tree.

(3) The lumber should be manufactured on modern machinery, so as to insure a uniform thickness, and it should be cut from all four sides of the log.

(4) The lumber should be piled with the lengths separated in piles not over six feet in width and with a foundation every two feet. The crossers should be of dry wood 1 in. x 3 in. pieces for the head and tail crossers and 1 in. x 2 in. for the others. Care should be taken to have each layer of crossers come directly over the one beneath, and the head and tail crossers should protrude from ½ in. to 1 in. over the end of the board, to prevent end-splitting. It is best to place crossers every two feet. It goes without saying that the pile should have plenty of pitch and in stacking care should be taken to place the sap side of the board down, as this prevents worms to a large extent. A space of from ½ in. to 1 in. should be left between each board for air circulation and the piles should be at least 18 in. off the ground.

The lumber should be left on sticks at least seven months and then taken down and bulk piled for at least two weeks before shipping. This bulking process tends to remove any little kinks which may have developed in the drying of the lumber. The stock is then ready for shipment.

When the consumer receives the lumber he must take the same care in handling the stock that the mill man has taken, especially if the stock is not to be used for some time. However, it is not necessary to place the lumber on sticks, unless it is to remain unused for more than sixty days. When the lumber is to be put into the kiln it should be placed on trucks with crossers every two feet placed DIRECTLY over each other and with a 1 in. space between the boards. The metal parts of the truck should then be well greased to prevent corroding and then the truck should be placed in a "sweat box" for about ten hours. This is nothing but an airtight box into which exhaust steam is run. In this apparatus the lumber is literally cooked and every vestige of a twist or kink is removed from the lumber and, furthermore, it will not return. The truck, after this sweating process, should go immediately into the kiln, which should be about 160 deg.

In the front end of the kiln should be placed a steam jet to prevent the lumber, which already contains so much moisture from the sweating process, from drying too rapidly and case-hardening. The stock should remain in the kiln at 160 deg. for about eight days, or until the moisture content of the lumber has been reduced to about 6 per cent. by weight. This percentage can be determined by sawing a board in two and cutting off four or five pieces of the RED GUM (the sap dries about twice as fast as the RED GUM) about ⅛-in. in thickness. These little pieces should then be weighed accurately and placed in on oven and baked for about two hours until every vestige of moisture has been removed, then weighed again and the percentage of moisture calculated. When this percentage reached 6 per cent. or less, the lumber is dry and ready for use. We cannot very well give any degree of humidity that should be maintained in the kiln, for every kiln will be found to work better at different degrees. The correct humidity can be found by experiment.

Gum after being treated as above outlined will not warp or twist when worked into the finished product and can be handled just the same as any other cabinet wood.

The Hardwood Market

NO developments have taken place in the hardwood trade since the middle of January to disturb the general signs of revival that have been so noticeable since the advent of the new year. Consumers have been buying upon the hand-to-mouth basis for such a length of time that they would appear to be somewhat dilatory in working round to the customary method of purchasing in quantities. This evidence of caution is only natural, however, in view of the depression through which the trade has passed, and after all it may prove the wisest course in the end. Although the export market in Canadian hardwoods showed a considerable decrease towards the end of 1913 there is nothing about it to create surprise, when the period of the year is considered. Already signs are not wanting that business is recovering rapidly. Reports to hand from Western Ontario are reassuring evidence that with the approach of better weather and the gradual opening up of building and other operations, a return to normal trade conditions is only a matter of time. That the turn of the tide has already taken place is evidenced in the enquiries consumers are making, which is a pleasing contrast to their attitude six months ago when lumber was generally one of the banned subjects of discussion. Now that the furniture exhibitions are over it is not too much to anticipate that manufacturers will be applied to for liberal requisitions at an early date. Local hardwood men are looking forward to business opening up considerably in the next few weeks. According to reports there is no indication at the present time of any easing off in hardwood prices in Ontario. One-inch firsts and seconds birch is being used quite extensively for interior trim and there seems to be an increased demand for this particular wood. Ash was very scarce during 1913, the demand for it being greater than the supply. Lumber men catering to the factory trade state that they are already receiving numerous enquiries and a few orders, and that prospects for more active movements, as soon as definite plans for the years' operations are matured, are decidedly encouraging. It is said that the production of oak is to be heavily curtailed this year because of the scarcity of logs. Reports from United States manufacturers predict a big advance in oak values before the end of 1914. One extensive manufacturer of oak lumber has expressed the opinion that by the end of the year plain firsts and seconds one-inch oak will be selling at $80, and No. 1 common at $50. Members of the trade generally believe that values are bound to advance, but many are inclined to the belief that this will depend largely on the consumer. Amongst the standard hardwoods the quotations are: black ash, 1-in. car lots, No. 1 common and better $40 to $45; 1½ and 2-in., $50 to $55; No. 1 common birch, $33; firsts and seconds ranging from $42 to $50, according to thickness; 1½ and 2-in. plain white oak is quoted at $70, and No. 1 common at $55; other qualities ranging from $70 to $88. In the mahogany market recent developments point to an advance even beyond last years' high price. A new factor in the situation in the United States is the advent of English and German mahogany dealers as strong competitors. Since the beginning of the year one cargo of central American mahogany valued at $100,000 has been exported by a United States mahogany manufacturer from New Orleans. This certainly indicates a larger movement of mahogany and might be taken as an indication of much high prices in the near future. A report from prominent mahogany brokers of Liverpool states that at a recent sale the competition for good logs was very keen but at least 85 per cent. of the lumber was very poor grade. This firm also stated that the decline in imports during the last few months would develop to such an extent that an absolute famine of good logs would be likely to intervene. Taking a broad view of the business conditions the financial situation would appear to have improved materially. A great deal of money has been placed in circulation during the last few weeks, with the result that industrial development and industrial investments will benefit very largely as well as assist in the general restoration of prosperous conditions.

Discussing the conditions in the current issue, the American Lumberman has this to say:

"Hardwood is showing some improvement and the prospects for spring trade are in all respects deemed favorable. Log shortage is reported both north and south, and as the market already is strong some difficulty is to be expected in the filling of orders when the rush comes. Furniture men, having returned from their annual exhibitions in a frame of mind verging on jubilation, are expected to come into the market with liberal requisitions at an early date. Veneer mills are cutting at full capacity with the assurance that their stocks will be in strong demand. Many factors have combined to retard foreign transactions in American hardwoods. High cargo rates from New Orleans on American lumber, unsettled financial conditions owing to the Balkan war, and keen competition from Russia and Japan are the dominating influences working against the export business. Exporters are, however, hopeful of an early improvement, though they believe that no great expansion in this trade is likely soon. From St. Louis a steady call is reported for plain sawed white oak, red gum, wide poplar and ash. Yard and factory stocks are reported low and buying on a normal scale may be expected to begin at any time. Prices on most items are ruling firm."

In a review of the market generally the Hardwood Record says:

"The various woods show a proportionate improvement, with the greatest strengthening in the upper grades. Quartered oak is still a strong factor and it is reported that plain oak is showing a noticeably increased demand. It cannot be said that the gum situation has improved very much, although there is proof that such an improvement is anticipated in the near future. As an instance, one large manufacturer recently turned down an order for 1,000,000 feet for future delivery and advised its customer that it would take care of its immediate requirements, but had entire confidence in an improved condition in the gum market during the next few months. This sentiment is apparent throughout the gum-producing section. The general opinion seems to be that business looks good but that business men should not soar too high from the ground, but maintain a level and conservative position, there being a practical assurance that a healthy and satisfactory improvement will be consistently and continuously evident in the situation for some months to come."

An Important Industry at Prince Albert, Sask.

Woodworking Factory of The Great West Iron, Wood and Chemical Works, Limited

Of the various factories erected last year in Prince Albert, Sask., by the Great West Iron, Wood & Chemical Works, Limited, one of the largest and best equipped woodworking plants in the Dominion is worthy of special note. Located in the heart of the western lumber limits, Prince Albert is an ideal point for factories using lumber in any form. Several saw-mills with a daily capacity of almost a million feet are in and around the city, thus forming a permanent source of supply for raw materials.

The city of Prince Albert is developing at the present time at La Colle Falls a hydro-electric power plant, which is expected to generate between 10,000 and 20,000 h.p. In order to attract manufacturers, the council very wisely has reduced its power rate even now to about 1½ cents per kilowatt hour to manufactureers taking more than 300 h.p.

The Great West Iron, Wood & Chemical Works, Limited, were organized in the late fall of 1912, with a capital of $500,000. The Board of Directors consists of D. B. Hanna, Vice-President Canadian Northern Railway, Toronto; Hector McInnes, K.C., Director Bank of Nova Scotia, Dominion Steel Corporation, etc., Halifax, N.S.; Hon. F. H. Phippen, K.C., Director National Trust Company, Chief Counsel Canadian Northern Railway, Toronto; M. C. Grant, Director Pender Nail Works, Halifax, N.S.; and F. Frank, Managing Director, Prince Albert.

The site owned by the company comprises 75 acres, situated on the north side of the Saskatchewan river. Building operations were commenced on November 19th, 1912, and a force of several hundred men was kept constantly at work throughout the winter. All factories have been fully completed, and were ready for operations in less than eight months. The company now operates a large paint factory and varnish works, foundry and machine shop, can factory and nickel-plating plant, in addition to the woodworking factory.

The main building of the woodworking factory is 312 feet long and 84 feet wide. It is one storey high with a cupola roof reaching a maximum height measured from the floor of about 30 feet. There is not a dark corner in the entire building, two rows of windows running the full length of 312 feet under the cupola roof and all four outside walls carrying as many windows as they will admit. The interior of this building is divided into six separate departments by means of partition walls. These various departments, accommodate a planing mill, joinery department, sash and door department, veneering department and two erecting shops.

There is no steam engine used in this building. All machines are grouped around electrical motors varying between 10 h.p. and 30 h.p., and each department can be run as a distinct unit. The total horsepower of the electric motors is approximately 400. An exhaust blower system carries the shavings to the power house and deposits the sawdust in a separate bin for the use of the various shipping departments.

Although not much heavy planing mill work needs to be done, the planing mill department is nevertheless fitted up with highly efficient modern equipment. The various saw-mills in the vicinity do most of the planing work at a very attractive figure and relieve the planing mill department of the company to a great extent. Among the larger machines in the latter department may be mentioned a 15 in. Berlin matcher and moulder, two Preston power self-feed rip saws, a Ber-

Plant of The Great West Iron, Wood and Chemical Works, Limited, Prince Albert, Sask.

lin planer, a swing cut-off saw, a Berlin band re-saw of the largest type, two table cut-off saws, besides the various machines necessary for an up-to-date planing mill.

The next department is used for joinery work and occupies a floor space of 60 by 84 feet. It also accommodates an up-to-date turning shop, where some beautiful work is being done. Among the machines in this department are to be found another large Berlin matcher and moulder, an American machinery planer, several jointers, pony planers, a variety saw, a band saw, rip saw, scroll saw, boring machines, chain mortising machines, high speed spindle shapers and cut-off saws, and mitering machines. The spindle shapers as well as the mitering machines are of novel and peculiar construction, and we know of no other woodworking factory in Canada where they have been used before. An almost incredible amount of work leaves this department every day, and its capacity is such that it could readily hold its own with any mill on the North American continent.

All knives and saws are ground and sharpened by automatic precision machinery in the tool room. There are several grinders for band saws, circular saws, large and small machine knives, emery grinders, band saws, brazers and compression clamps.

The next department, with a floor space of 60 feet by 84 feet, accommodates the sash and door factory. Prominent amongst the machines are a big Berlin three-drum sander, two chain mortisers, two tenoning machines, two spindle shapers, a door sticker, panel raiser, door relishing machines, sash sticker, jointer, belt sander, sash relisher, arm sander, oak graining machines, etc.

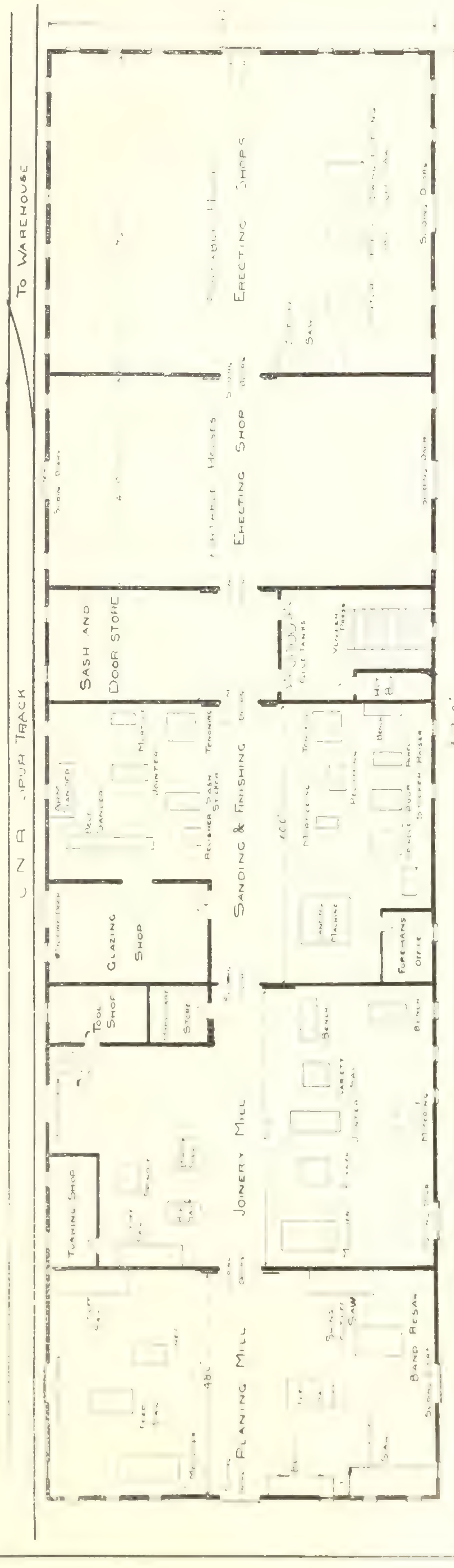
The veneering room which adjoins the sash and door department contains six large veneer presses, a hot box, and a battery of four glue tanks. These tanks are built of solid copper and are steam jacketted. The liquid glue is drawn off through faucets. Thermometers, which are attached to every tank, indicate the exact degree of heat of the liquid glue, and each heater contains a special mixing device which is operated by means of a crank on top of the tank.

The erecting departments occupy a floor space of 118 feet by 84 feet, and are equipped with cut-off saws, tilting saw, jointers, rip saws, variety saw and boring machine.

The building is well ventilated, and is lighted by electricity throughout. The major part of this factory is given up to the production of ready-made and portable houses, which are constructed under Canadian and foreign patents. The capacity of the factory at the present time is twenty-five two-roomed houses every ten hours, and about 250 doors and 500 windows. The total floor space utilized in the main building of the woodworking factory is about 28,000 square feet.

A spur track of the Canadian Northern Railway runs along the entire length of the building and connects with another spur track running from the company's foundry to the south, thus affording ample facilities for switching.

On the opposite side of the railway track is a lumber dry shed, 50 feet wide by 150 feet long, and 30 feet high, which accommodates between thirty and forty carloads of kiln-dried lumber. Adjoining this lumber shed is the general lumber yard, where at the present time between 400,000 and 500,000 feet of fir, spruce and pine are stacked. Between the lumber shed and the woodworking factory is the time office, which is a



LAY-OUT OF THE GREAT WEST PLANT, PRINCE ALBERT, SASK.

small building by itself. All men must pass through this time office and punch the time clocks in order to gain access to the plant.

The dry kiln is just being completed on the natural draft system in a reinforced concrete building, 30 feet by 60 feet. Next to this dry kiln is the main power house, containing boilers aggregating approximately 1,000 h.p., which serve all factories.

The paint factory is a four and a half storey building, 50 feet by 108 feet, with a capacity of 2,000 gallons of paint and varnishes per day in addition to 25 tons of putty. The building is provided with an electric freight elevator. The machinery used has all been manufactured according to special designs, and is entirely automatic. The crude raw materials enter the breakers and mixers on the top floor, where motors aggregating over 200 h.p. begin their work, which turns these into liquid and paste paints of magnificent colors and brilliancy. All oils and liquids are pumped into the various tanks by a special pumping system which reaches all floors. On the ground floor is the filling and labelling department. A large number of closing machines, as well as electric labelling machines are in evidence.

Next to the paint factory is the general warehouse, 56 feet by 150 feet, with a railway platform of 150 feet. This warehouse is one and a half storeys high with a cupola roof. All manufactured paints and varnishes, as well as a large line of builders' hardware, stencilling and nailing machines, glass, and raw materials of every description are stored here. Shipping is done from this warehouse, which resembles a huge hardware store in appearance.

Following the north branch of the railway track for about 300 feet, we arrive at a very large foundry building, which is almost as big as the woodworking factory. The southern part is divided into three compartments, which are used for the can factory, machine shop and nickel-plating plants.

The can factory has a capacity of 30,000 cans per day. It is equipped with three powerful Horne presses, cutting machines, rolling machines, punching machines, and automatic soldering machines. An independent gas plant in connection with this can factory generates all the gas needed for the soldering machine.

The machine shop is well equipped to do all kinds of general repair work and machine work. The electro-plating plant contains plating dynamo and a battery of large tanks fitted up with nickel and copper anodes and kathodes and various other devices. The castings for stoves and ranges coming from the foundry will here be nickel or copper plated.

Adjoining the electro-plating plant is the pattern shop for the foundry, which is equipped with a large Crescent Universal woodworker, jointer and band saw. The foundry room covers an area of 84 feet by 140 feet. The Colliaux cupola has a melting capacity of thirty tons per day, a 15 h.p. blower creating the air draft in the furnace.

The general office building covers a lot 30 feet by 56 feet and is two storeys high. It contains the bookkeeping, advertising, drafting and executive departments. A well-equipped printing shop is also located there, and a private telephone exchange connects with every plant on the premises. Both the Canadian Northern and the Canadian Pacific Railways maintain private telegraph wires to this building for the exclusive use of the Great West Iron, Wood & Chemical Works.

Efficient Methods of Driving Woodworking Machines

IN belting up a planer and matcher the old way was to cut the belts somewhat shorter than the distance around each set of pulleys, and force them on by main strength and perseverance, with the idea that this would prevent slippage.

It is a well-known fact that leather belting stretches more or less when running. This is due to centrifugal force as well as the pull of the belt in driving the machine. The stretch of the belt causes more or less slack on the side opposite the pull. As the slack increases so also does the slippage on the driven pulley.

It is necessary in some cases to have belts so tight under duty, to prevent slippage, that some method of relieving the strain when idle was considered necessary. A belt-releasing device has been tried by some. With this device, by manipulating a lever, all belts on the machine are relieved from strain whenever a long stop is made. But before the machine is started the lever has to be thrown back again and the belts highly tensioned, so that the strain on the cutterheads is the same whether the machine is actually working or running idle.

The latest method of belting matchers, double surfacers, timber sizers, etc., makes provision for using endless belts throughout. Each belt has its own individual gravity tightener on the slack side of the belt. This method of tensioning enables the belts to pull the cutterheads of any of these machines through maximum cuts without slippage. At the same time there is comparatively little, if any ,tension on the belts when the machines are at rest.

The top head belts run around the pulleys on countershaft and under the gravity tighteners. The bottom head belts run from pulleys on the cutterhead right under the top head belts, wrap part way around the same drive pulleys over top head belt, then over idler pulleys mounted on a shaft in babbitted bearings, then downward under tightener pulleys and back to bottom head pulleys. This gives the reverse motion to the bottom head.

The side spindles are belted in a similar manner. The belts run from the side spindle pulleys back to the drum pulleys, almost in a horizontal position, then up around the drum and under the gravity tighteners, which also serve as guide pulleys to lead the belt properly onto the side head pulley. These side head tighteners are mounted on a shaft running across the base of machine near the front. The bottom or pulling belt runs through a guide pocket in the tightener arm, which leads the tightener back and forth across machine as the side head is adjusted. This action is entirely automatic.

With this method of belting the strain on cutterhead journals is greatly reduced, even when taking the heaviest cuts. In other words, the pressure is proportionate to the need of the work. When the machine is at rest the belts are comparatively loose, with very little strain on the spindles. But when in a heavy cut and the belts stretch somewhat, the tighteners on the slack side of belts will keep taking up the slack and cause them to pull the heaviest cuts without slippage. This not only reduces the pressure and wear in cutterhead journals, but greatly prolongs the life of belts and reduces belt troubles to a minimum.

For some reasons and in some places the ideal method of driving machines is by individual motors, direct connected to the countershaft. It is to be admitted that such an installation is more expensive than the lineshaft method, or group method. It has, however, an advantage over the latter method in low cost of upkeep and cost of power actually used.

The position of some countershafts is of assistance in installations with individual motors. When the main countershaft is placed high from the floor it is well adapted for direct connection to any motor without blocking up the machine or cutting a hole in the floor for the motor, as is the case with machines where the counter is placed too close to the floor.—R. E. Williams in the Wood-Worker.

Safety Devices for Woodworking Machinery

Contributed by Robert Murray, Toronto

DEVICES as shown in this article have been found by actual experience to be practicable, effective and in no way detrimental to the convenience of operators or to the output of the various woodworking machines. The greater number of these devices have been evolved from ideas originating with practical machinists, so they can be termed "home made" and for that reason, we believe, have proved more satisfactory because more applicable to the conditions to be met. The systematic safeguarding of machinery being a subject of recent development, these devices for the safe working of machines will be found to come up to modern requirements. With the invention and installation of perfected machinery comes a corresponding and direct benefit to the mechanic, both from a physical and financial standpoint, for while there is greater output and consequent increase in earning capacity, the physical strain is lessened and the surroundings more healthful.

Devices for Circular Saws

There are several devices for the safe working of circular saws, and the device illustrated in Fig. 1 has found most favor with experienced sawyers. This guard covers the saw which adjusts itself automatically to material of different thicknesses, and is made up of the following parts shown in the sketch. In (a) the main part of the guard is made of a good grade of sheet steel with flanges enclosing teeth of saw, with (b) projection on end of guard support to prevent guard from being thrown backward out of position. If raised up to the lug and released, the guard will fall back into proper position for protection. At (c) is the support for guard attached beneath the bed of the saw, and it also should be made of a good grade of metal, the front edge of support being a slight degree thicker than the saw and increasing slightly in thickness toward the back edge. This support for the guard serves the additional useful purpose of a river, which prevents the wood from pinching the saw and being kicked back towards the operator.

Where feed wheels are used they should be covered by hoods of strong material, securely attached, which should extend down in front of wheels as far as permissible. (Fig. 3). The operating saw itself should have a hood too, supported by an arm fixed on the side of the saw table, and this device lessens the risk of fingers being lost, and retards the sawdust from flying into the machinist's eyes. The jointer knives should be covered either with a fixed or spring moving guard. With the fixed guard in operation the guard is set back far enough to allow the thickness of timber being used to pass comfortably between it and the fence. The guard which is operated by a spring covers the whole knives and is only pushed back by actual operation, so there is no danger of the operator's hands coming in contact with the cutters. Regarding the planing machines the openings in the beds of all planers when exposed by any movement of the carriage should be provided with a covering applied immediately beneath the carriage and secured firmly in place by means of screws. The covering should be of solid material, preferably sheet metal, with no slots or openings, except where small slots or openings may be found necessary to allow escape of cuttings, in which case the openings shall not be large enough for one to insert his hand. Wood may be used for this covering but its use is not recommended.

Band Saw Dangers

The band saw is a machine that causes the management of a woodworking factory a great deal of anxiety if the saw is not safely guarded. First of all both pulleys should be completely enclosed, the top one being best caged in with wire netting of a fine mesh, which is attached to the fixed part of the machine that it can be removed easily when changing the saw blades. The bottom pulley is best covered with wood or metal. The teeth on the back or return part of the saw should be guarded for a sufficient distance above the table to prevent the operator from coming in contact with it. Where practicable this guard should extend the entire distance from the table to the guard over the upper pulley, and there should be an adjustable angle iron for forward part of saw and guard in front of rim of upper pulley. Then we have the shaper or spindle machine which is very dangerous to work unless proper guards are in place. Here we have, besides the ordinary fence, a block of wood fitted round the collars of the shaper with just a small opening in the same line as the fence. Some use a block of wood with a notch in it the size of the material being moulded, so that if the lumber happens to be knotty there is no danger of it being thrown back towards the operator. The gainer is another machine which requires a great deal of care to operate. This has a guard in the shape of a hood which completely covers the knives, both edges and sides, and it is made from good sheet metal. There should also be a lever for holding the material in place as far better work can be

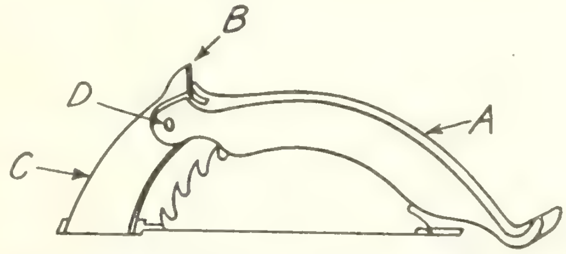


Fig. 1.—Guard which adjusts itself automatically to material of different thicknesses.

done when this is used and besides it is not so trying on the nerves.

Proper Guarding of Emery Wheels

No woodworking factory can afford to do without emery wheels as they are more frequently used than the slower grindstone. They have to be properly guarded also, (Fig. 2) as many known cases of an emery wheel bursting have come under our notice. First of all the wheel should have relieved flanges with compressible washers between the wheel and flange, and a perfect bearing on the outer edge. The complete wheel should fit easily on the operating shaft and be keyed or shrunk on. The wheel itself is protected by secure guards enclosing the entire rim of the wheel except the necessary grinding surface. The guards should be made of sheet metal of sufficient weight and thickness to withstand the force of flying pieces of the wheel in case of breakage. When high speed is necessary, leather spark brushes or glass shields are fitted, and with those guards, coupled with a reliable make of emery wheel there should be no trouble.

Where counterweights are used above the floor line they should be enclosed by a secure casing in the shape of a tube, and where used in pits below the floor line the whole should have a proper cover also. In the machinery of to-day, manufacturers are designing their various machines erected with all set screws, nuts, and bolt heads, wherever located, being countersunk or protected by safety collars or flanges, and this has been found to be a great advantage by the practical machinist. Another matter which is often overlooked is the "dead shafting." When necessary it should be covered with a tube of smooth surface of good material. This tube is secured in place by a stout wire so that it will remain firmly in place around the shafting when in motion. In a factory where turning lathes are used the end gears are usually covered with a guard made of metal (as in illustration 4) and woven wire of 1-in. mesh. This guard is attached to the machine with loose pin butt hinges, so arranged that it automatically closes. This is necessary in order to prevent a careless machinist from leaving the guard open and operating the machine without the necessary protection. The guard should be no larger than required to enclose the parts of the machine needing protection and should be applied to the machine as closely as possible. On some machines there is a hole cut in the guard to permit adjustment of the feed bar without removing the guard.

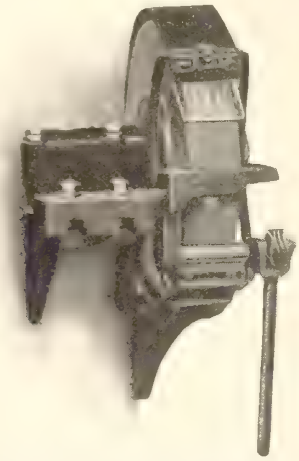


Fig. 2.—Protection hood and glass shield for emery wheels. Hood in position extends over rest.

It is customary to enclose all flywheels and pulleys located at or within seven feet of the floor, the material usually used being wire netting of small mesh.

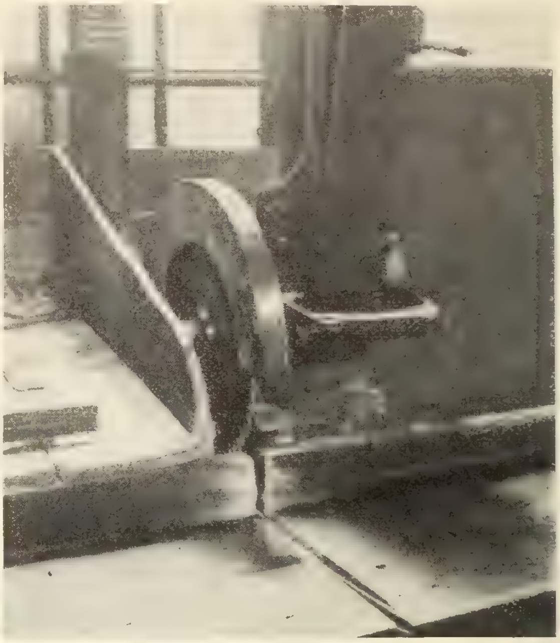


Fig. 3.—Guard in position—can be removed when necessary to change saw.

The flywheels and pulleys located more than seven feet from the floor should be protected when necessary. These suggestions do not apply to flywheels and pulleys in engine or power rooms, as they are usually surrounded with wood, brass or iron pipe railings, of suitable height and strength, and applied as close to machinery as permissible. Where flywheels and pulleys extend below the floor line a "toe board" at least six inches high, made of metal or wood, should be applied at the edge of the opening for the entire distance around.

Where electricity is used as a propelling power all starting switches, rheostats and circuit breakers should be enclosed by a metal covering fastened securely around the apparatus and provided with slots for levers and handles to ensure freedom in operation. Always

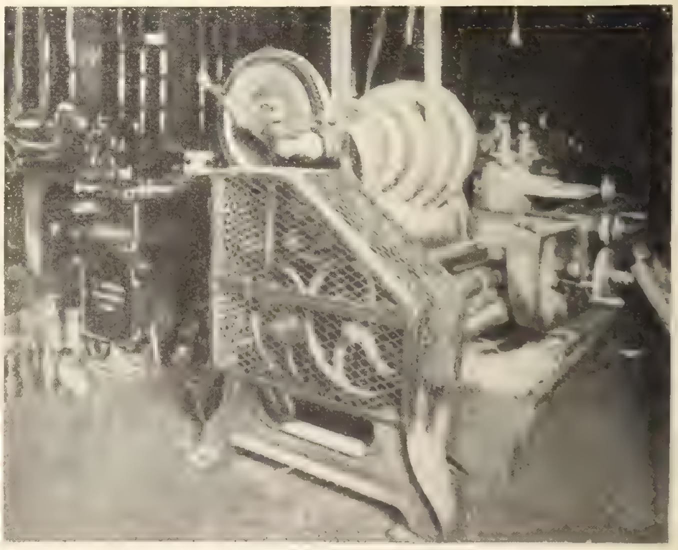


Fig. 4.—End gears of lathe enclosed with guard of expanded metal which may be used instead of woven wire.

be on the lookout for cracks or blisters as these are liable to occur in the best plate iron, and when a flaw is detected there must be no delay in having it properly cared for.

In regard to steam power the following precautions are necessary to secure safety where a steam plant is used. First of all great care should be exercised to see that the safety valves are ample in size and in working order. Overloading and neglect frequently lead to disastrous results. Safety valves should be tested at least once a day to see that they will act freely. The steam gauge should stand at zero when the pressure is off, and should show the same pressure as the safety valve when the latter is blowing off. If not, then one is wrong, and the gauge should be tested with one known to be correct. The water gauges should be blown out frequently and the glasses and passages to gauges kept clean, as more accidents are attributed to this inattention than any other cause. The feed pump or injector has to be kept in perfect order and be of ample size, and it is always safer to have two means of feeding a boiler. Check valves and self-acting feed valves should be frequently examined and cleaned, to make sure that the valve is acting when the feed pump is at work.

Adaptation for Sanding

Contributed by George Clark, Toronto

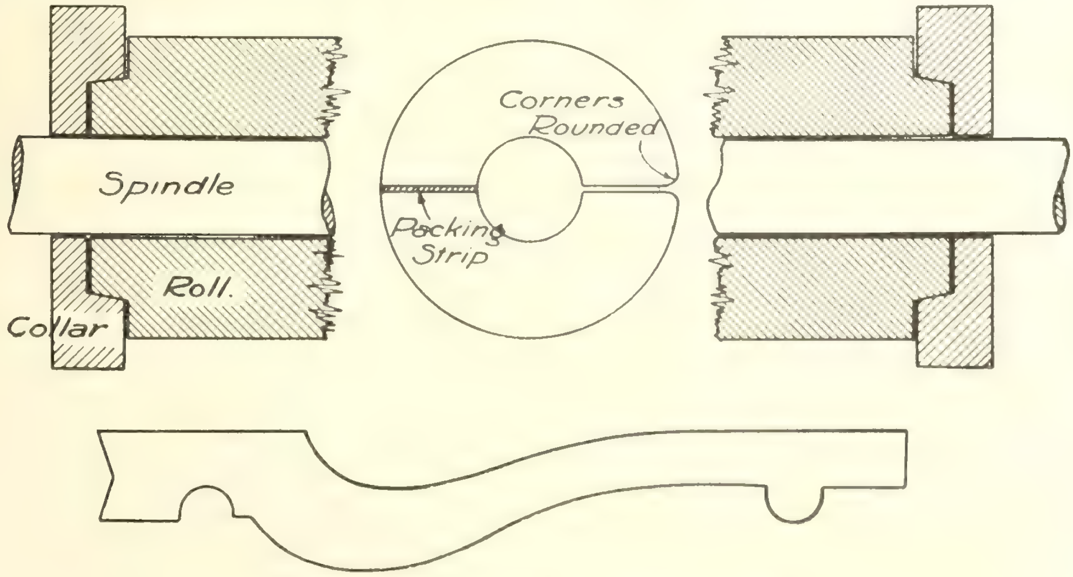
IN offering these hints the writer does not wish to be understood to recommend the use of made-up rigs for sanding or any other work if there is sufficient work to keep a proper machine going, for the time lost in adapting another machine temporarily, and the time that the same machine may be held up from its proper work, will very soon offset any saving in the first cost, even if the quality of the work turned out be equal to that of a special machine. On the other hand, in cases of small plants where the classes of sanding, mentioned later, are not often met with, the temporary adaptation of one or other of the existing machines may prove a real economy, not only in the matter of cost, but also of space in the shop.

As an example, take the cut baluster pattern shown. In some localities balusters almost rival turned balusters for verandah work; consequently, mills in these places would find it pays to have proper sanding apparatus; but a mill getting such work only once in a while, would be justified in making shift with some additions to existing machines.

For the curved lines a spindle sander is the requirement, and by making a cylinder in two sections to fit on the spindle of the shaper, a very reputable spindle sander can be made. Of course, the oscillating motion of a true sander is absent and this is one of the reasons why a proper machine should always be installed if there is enough work to keep it going.

The roll for the spindle is made of birch or maple, as are the retaining collars for the ends. The block should be bored to fit the spindle of the shaper before turning and should be placed on a mandrel for centering in the lathes. For sectional detail of roll and collars see sketch annexed. Cones are turned on the ends and corresponding recesses in the collars to draw the two halves together. These cones should have a fairly quick taper or there will be a possibility of splitting the collars, besides getting them wedged on so tightly that it is almost impossible to remove them. As long as the collars will hold the two halves of the roll together when the spindle nut is screwed down, the requirements of the job will be met. After turning, the roll is sawn in halves and is then ready for use, except that a packing strip is made for the opening opposite to that in which the ends of the sandpaper are to be clamped. The corners of this opening should be rounded slightly to prevent cutting through the paper. Of course, the size of the roll will be governed by the work to be done and the machine to be used. The sketch merely gives the shape.

There are some excellent machines on the market for mitre sanding, but in case any shop should not have enough work to require one, a small sand disc, placed on the spindle of a tilting table saw bench, will answer very well. In place of a tilting table, the mitre cross-cut guide may be clamped in place to give the required angle.



Sectional detail of roll, with example of work.

Scientific Methods of Drying Lumber

Fundamental Principles Outlined in a Discussion of Satisfactory Seasoning of Timber—Importance of Adequate Circulation

By H. D. Tiemann

THE objects of drying wood may be grouped under three main headings: (1) To reduce shipping weight; (2) to reduce the quantity necessary to carry in stock; (3) to prepare the wood for use and improve its qualities.

When the wood will stand the temperature, drying to reduce weight is most easily accomplished by heating the wood above the boiling point in a closed chamber but so arranged that the excess steam produced will escape. This process manifestly does not apply to hardwoods, but is applicable to many of the soft woods. It is used especially in the Northwest, where inch Douglas fir is dried in from forty to sixty-five hours and sometimes in as short as twenty-four hours. In the latter case superheated steam at 300 deg. F. was forced into the chamber but, of course, the lumber could not be heated thereby much above the boiling point so long as it contained any free water. The heat of evaporation may be supplied either by superheated steam or by steam pipes within the kiln itself.

The quantity of wood it is necessary to hold in stock is naturally reduced when either of the other two objects is attained, and therefore, need not be discussed here.

In drying to prepare for use and to improve quality careful and technical drying is called for. This applies more particularly to the hardwoods, although it may be required for softwoods also.

Practice of Drying Not Standardized

Present practice of kiln drying varies tremendously and there is no uniformity or standard method. Temperatures vary anywhere from 65 to 165 deg. F., or even higher, and inch stuff three to six months on the sticks is being dried in from four days to three weeks, and 3-inch stuff in from two to five months. Many kilns make a hit at superficial points and fall down on the fundamentals.

Methods of Drying and Types of Kilns

All methods in use at atmospheric pressure may be classified under the following headings. The kilns may be either progressive or compartment, and preliminary steaming may or may not accompany any one of these methods:

1. Dry air. Generally obsolete.
2. Moist air.
    a. Ventilated.
    b. Forced draft.
    c. Condensing.
    d. Humidity regulated.
    e. Oven or boiling.
3. Superheated steam.

Losses Due to Poor Drying

In some cases there is practically no loss, but more often it ranges from 1 to 3 per cent. and 7 to 10 in refractory woods, such as gum. In some cases the losses are as high as 33 per cent. Air drying is by no means always to be preferred to kiln drying. In air drying there is little or no control over the process; it may take place too rapidly some days and too slowly others; it may be very non-uniform. Hardwoods in large sizes almost invariably check. By proper kiln drying these unfavorable circumstances may be eliminated. However, air drying is unquestionably to be preferred to bad kiln drying, and when there is any doubt in the case it is generally safer to trust to air drying. Green lumber can be better dried in the kiln if the fundamental principles are all taken care of.

Value of Using a Proper Method of Kiln Drying Instead of Air Drying

Some of the advantages of kiln drying to be secured over air drying in addition to reduction of shipping weight and lessening quantity of stock are the following: less material lost; better quality of product; prevention of sap stain; fixation of gums and resins; reduction of hygroscopicity.

Experiments have shown that drying oak and ash at 145 to 170 deg. F. has reduced the hygroscopicity 15 to 25 per cent. Specimens from the same sticks were both air dried and kiln dried, then placed side by side on a rack for over a year, and their moisture contents then determined. This reduction in moisture means a reduction in the "working" of the material which, even though slight, is of very great importance.

Some of the Fundamental Principles Affecting the Drying of Wood

1. The evaporation from the surface of a stick should not exceed the rate which the moisture transfuses from the interior to the surface.

2. Moisture tends to transfuse from the hot toward the cold portions.

3. Wood is soft and plastic while hot and moist and will become set in whatever shape it is in as it dries.

4. Shrinkage is greater the higher the temperature of drying while still moist.

5. Case-hardening and honeycombing result from the two foregoing circumstances. It may be explained thus: Suppose a block of wood is very wet and is placed in at too high a temperature and too low a humidity. The surface begins to dry and tends to shrink, but is prevented from doing so by the wet interior. Being plastic, it yields to this resistance and becomes stretched. If not plastic it will check open. As drying proceeds it becomes hard and set in this expanded condition and acts as a strong shell. The interior now dries very slowly, does not become set, but shrinks, and, as the exterior is already hard, it opens up into honeycombing. When the exterior once becomes set or "case-hardened," the interior is almost certain to become honeycombed, whether the drying takes place in the kiln or a long time afterward. The only remedy is to moisten the exterior by steaming or soaking before it is too late. Air-dried material frequently case-hardens and honeycombs as well as kiln dried. (Samples of sections of white oak felloes exhibited showing one badly honeycombed and the other excellently dried.)

6. Drying should take place uniformly at all points; otherwise stresses are set up in the wood.

7. Brittleness is produced by drying too far.

8. Dried wood absorbs or loses moisture in proportion to the relative humidity in the air.

9. The hygroscopicity and working are reduced by thorough drying, but not eliminated.

To properly utilize these principles in drying, attention should be given to the following factors:

1. The lumber should be heated clear through before drying begins.

2. Humidity should be correct at the start and reduced in the proper ratio as the drying progresses.

3. The temperature of the lumber should be uniform and as high as the kind of material will endure.

4. The rate of drying should be controlled by the amount of humidity in the air and not by the rate of circulation. The circulation should be ample at all points to supply the heat needed for vaporization and to keep the humidity uniform. To evaporate one pound of water at atmospheric pressure requires the amount of heat given up by 69,000 cubic feet of dry air in falling one degree Fahrenheit. The regulation of the humidity is to prevent the surface from drying down to the point where it takes a "set" before the interior has dried to nearly the same amount, thus preventing case-hardening. If dried too rapidly, case-hardening will result.

5. The degree of dryness obtained should conform with the use to which the wood is to be put.

Ideal drying depends upon: ample circulation; control of humidity at all times; proper temperature.

Any kiln which fulfills these conditions should be capable of giving perfect drying.

Keeping Tab of Tools in Machine Woodworking

Contributed by Leonard A. Blake, Toronto

THE old maxim, "Order is Heaven's first law," is one that should be retained by the machine woodworker. The knives and spare parts belonging, for instance, to the sticker, are sufficiently bewildering in themselves without having to go through the whole lot in search of some particular article required. Everything should have its place and after use should be put back in that place, so that if the parts are kept near the machine the operator, without any hesitation—perhaps without even looking directly at the cupboard or locker can pick up in turn the knives, cutter bolts, etc., required for the job in hand. In the course of time all this becomes automatic and each knife finds its correct place without any actual thought on the part of the operator.

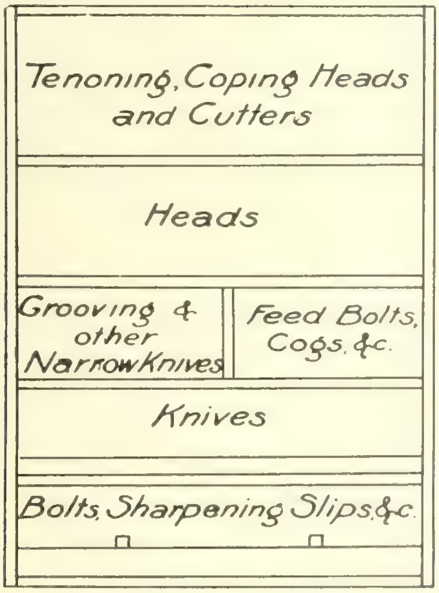

Tenoning, Coping Heads and Cutters
Heads
Grooving & other Narrow Knives
Feed Bolts, Cogs, &c.
Knives
Bolts, Sharpening Slips, &c.

Fig. 1—Sticker cupboard.

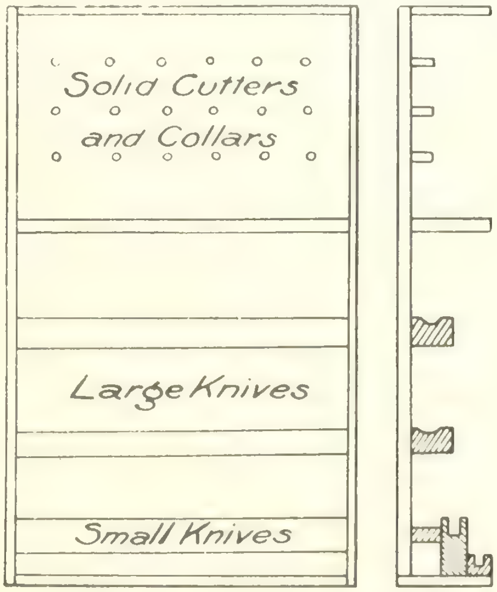


Fig. 2—Shaper cupboard.

In Fig. 1 we have a useful layout for a locker in use in connection with sash and door work, and including besides the space for sticker parts a section for coping heads, and knives belonging to the tenoner. The bottom space is divided into three parts and has a ledge about 1½ in. deep along the front, as it is intended for bolts, sharpening slips, etc. When it is possible to place the locker quite close to the machine, it is useful to keep a shallow can in one division of this bottom shelf, to contain oil for sharpening. It is much quicker to dip the stone into the oil than to have to turn up the oil can every time more lubricant is needed. The second shelf carries all flat knives, and if there are enough knives in use to require a double row, the back row should be raised two inches, so that all the profiles are visible without moving any of the front row. Over the flat slotted knives is a space with nails or hooks in the back to accommodate the J-shaped cutters sometimes used for grooves, small beads, and tools which do not require a knife more than 1 in. wide. In this division spare feed rolls and cogs are also hung.

As sash sticking is nearly all to stock patterns, built-up heads are used to save setting, and the fourth shelf is intended to accommodate these heads. It is the size of these heads that will decide the depth of the cupboard if a door is to be used, and this is almost a necessity. When several permanently set-up coping heads are used with the tenoning machine, to match the sticker heads, they, too, can be kept in the top division, and also any spare knives for special work.

Shaper knives, at any rate in planing mills where there is no regular shaper man, are about the most abused cutters in the whole shop. Either they are laid flat on a shelf, which makes them very difficult to pick up, or else they are tumbled indiscriminately into a box, and when some of them are needed they are tipped out in a heap on the shaper table. Sometimes both methods are in use, the larger knives going into the shelf and the smaller ones into the box. It would be hard to conceive of any other means, short of deliberate filing, by which the cutting edges of the knives can be destroyed so quickly. And look at the time lost in hunting through a miscellaneous collection of small steel cutters, for a pair to work a required mould.

All cutters should be kept in pairs and should be stored so that their profiles are clearly visible. Fig. 2 shows a form of rack which will provide alike for large and small knives, besides collars and solid cutters. The small knives are carried in grooved strips at the bottom, the groove being just wide enough to hold a pair of cutters fairly tightly. Above them the larger cutters stand in the V-grooves, so that each knife is picked out easily. The top section is devoted to collars and solid cutters, which are hung on dowels put into the back of the locker.

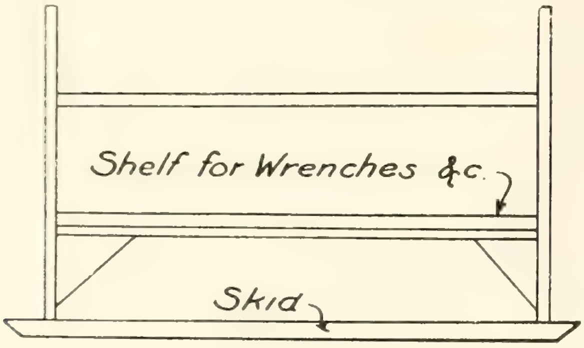


Fig. 3—Sash sticker stool.

In connection with the sash sticker there are, of course, a number of wrenches not provided for by the locker just described, which can be kept on a shelf under a sort of combination stool as shown by Fig. 3. The primary object of this stool is to carry short sash bars ready for re-sticking, where a single-headed sticker is used. Having skids it is easily slid around when loaded, and although the wrenches occupy the lower shelf, they can be laid on the top when used for setting up.

Mortise chains and guides should be kept in an oil bath when not in use, so as to loosen all gum which may accumulate in the joints of the chain during use and which cannot be removed by hand. The chains and guides should have a piece of coarse mesh screen wire under them so that gum soaked off by the oil can sink clear below them. A small proportion of coal oil with machine oil is the best.

The dust of hardwood is said to be utilized by the German inventors as an antiseptic dressing. The sawdust is placed in an oven and subjected to an intense heat which not only thoroughly dries but purifies it, and it is said to be made successful use of in the leading hospitals in Europe.

The Commercial Utility of Ironwood

With the rapid cutting of our more common and valuable hardwoods, we are constantly on the lookout for new woods to take their places in the ever increasing lines of utilization that are being demanded of our hardwood supplies, writes N. C. B. in the Hardwood Record. In this way, beech and sycamore, and in more recent years red gum, were developed and now play an important part in our markets for flooring, interior finish, general woodworking and furniture material.

Ironwood is not at present an important factor on our markets and probably never will reach the importance of the woods just mentioned, but it is distributed over such a wide range and produces a wood of such high technical qualities that it will soon fill a place on the markets, at least locally, for a great variety of uses. It is found all over the East from Cape Breton in eastern Canada west to northern Minnesota and the Black Hills of South Dakota (one of the few places where our eastern and western trees meet). From these northern and western limits it reaches south to northern Florida and eastern Texas. It occurs as a scattered tree throughout our hardwood forests. Little attention has been paid to it in the past because of its scarcity and comparatively small size in the greater part of its range. But in portions of the South, along the Appalachian mountains and in New York, it commonly grows up to two feet or more in diameter and ninety feet in height.

There are several trees in this country which go by the name of ironwood, especially tropical or sub-tropical varieties in the South. Ironwood (Ostrya virginiana) is also called hop hornbeam or hornbeam. It is in the birch family and its wood closely resembles that of red birch in texture, but not in weight or color.

Its wood may be described as being very hard, heavy, tough and durable. Its name is well deserved. The wood has a specific gravity of .83, and among our common hardwoods is exceeded in weight only by hickory. In color it is light brown, with pale white sapwood. Both heart and sap become a distinct brown when seasoned.

The hard, tough, durable qualities of ironwood make it admirable for certain specialized uses, especially where resistance to impact is necessary. It is very difficult to split and with this exception, it can be used to a great extent as a substitute for our rapidly disappearing hickory and in some cases white oak.

Some of the more common lines of utilization in which ironwood may be now found are for brake blocks, piling blocks, sills where great strength and durability are required, tool handles, agricultural implements, posts, hames, and general woodenware where strength and toughness are demanded. It is also being used for bobbins, spools and shuttles along with dogwood, persimmon and paper birch, and for chair rounds and legs. Other specialized uses for which its good technical qualities make it adaptable are mauls and sledges where hardness, weight, and resistance to impact are demanded. It is well adapted for use as vehicle and implement stock and it is probable that it will be called upon to take the place of hickory and white oak in a great many of its specialized uses. In many ways it also resembles dogwood, which is being demanded more and more for certain lines of wood utilization. Little known species like ironwood will be welcomed to help supply the growing and varied demands for the products of our hardwood forests.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Question.—Is there any machine doing the same or better work than the Sander?

Answer.—This is pretty hard to say, as the management of machinery has more to do with the cost of its operation and quality of its output than its construction. Sanders are pretty efficient now and probably give the best all around service. For some classes of work, however, the power Scraper is without equal, and you might find one of these machines just what you want. Write Baxter D. Whitney Company, Winchendon, Mass.

Question.—What is the best polishing material for use in tumbling barrels with small pieces of wood.

Answer.—Be sure the rattlers are small enough to work through the packed barrel. Pour in some melted paraffine, not too much or too hot, and see what you get. Different woods require different treatment, but after a little experiment you will be able to get excellent results with the paraffine, except when the wood is too soft or is cut roughly.

Question.—We are having trouble with our band ripsaw, the blade running against the guide and heating. We use 2-in. blades and wish to rip about eight inches wide.

Answer.—True up your wheels whether they are steel or leather faced. Line the wheels and take the slack out of the bearings. Use a wider spacing of teeth and a little more swedge or set. Don't try to feed too slow.

Question.—Can you recommend any particular kind of a Cutting Saw gauge which will permit selective cutting of lumber, that is, allow the operator to cut up his boards accurately into several different lengths without stopping to measure them.

Answer.—Baldwin, Tuthill and Bolton, of Grand Rapids, Mich., make one of the best in this line.

Question.—Is there a hopper feed surfacer on the market, suitable for handling short lengths of glued up and solid stock?

Answer.—Such a machine is manufactured by the American Woodworking Machinery Company, of Rochester, N.Y., and the Berlin Machine Company, of Hamilton, Ont., advertised one for very short stock sometime ago, which the writer has never seen in operation, but which looks all right on paper.

Question.—Among the many types of incandescent lamps offered by salesmen, how is one to pick out the best?

Answer.—Send to the General Electric Company, of Schenectady, N.Y., for Bulletin 4850B. It contains data and in formation aplying to all makes of lamps. Select half a dozen lamps from different makers and get them tested at the nearest College or Laboratory for candle-power and watts per candle-power, which will tell you the whole story except the life of the lamp, which you must supply either from your past experience or by trial, putting the trial lamps up on the same circuit where they will get the same treatment. There are two types of tungsten lamps:—those with pressed filament, in which the lighting element is composed of short lengths of wire welded together at the supports, as per Fig. 1, and the continuous wire drawn filament, which is a single piece of wire laced over the supports, as shown in Fig. 2. The former should be avoided altogether at any price, and in the latter, the life will be largely affected by the tightness with which the wire is looped over the supports. It should rest in easy curves, and where the lamp is to be used in a vertical position only, pick a lamp having a very light spider at the bottom, while lamps operating in an inverted position should have heavy spiders at both ends. Some lamps have a curly filament, which may or may not add to the life of the lamp, depending upon the treatment it gets.

Question.—In selecting a dry kiln for drying either green or partly dried hardwoods, what are the principal points to be considered in order to get the best possible results?

Answer.—The first and most important point to be considered in buying a kiln, as in buying anything else, is the economy and efficiency of its operation extended over a number of years. In other words your first consideration is the cost per thousand feet of drying, and you should also be reasonably sure that the kiln will duplicate its performance indefinitely for given grades of stock. Do not inquire prices until you have made up your mind what is best suited to your requirements.

Your next consideration will be the space available, and the facilities possible for loading the lumber, transferring to the kiln and from the kiln to the mill. Consider no system that requires any handling of the boards other than loading at the kiln or at the piles in the yard if it is possible to extend your tracks that far, and unloading for the first operation. This is most important, for while you pay for the kiln but once you will pass many thousands of feet of lumber through it and an unnecessary handling expense may in time entirely dwarf the initial saving of a cheaper and less useful outfit.

There are many types of kilns, but constructionally there are but two—the Progressive type and the Box type, each adapted to certain lines of work. The former is generally conceded to be the cheapest to install, and the fastest to dry certain kinds of lumber, especially where the lumber handled is all of one kind or grade requiring the same treatment, while the box type is the easiest to regulate and the surest in results, and is applicable to a wide range of different stocks and conditions, as each different kind of lumber can be isolated and left unaffected by outside conditions until it is thoroughly treated, when it can be removed without changing the conditions surrounding other lots. In a properly constructed box kiln lumber can be dried to any predetermined degree, and the lumber comes out with sap and moisture removed in such a way as to make the dimensions of the pieces nearly permanent and unaffected by reasonable changes in the condition of the air.

Results can be made more certain by using the Condensing type of Box kiln in which it is possible to regulate exactly the humidity and temperature from the outside of the kiln.

Look carefully at the weight and quality of pipe, rails and rail mounting to secure perfect and permanent alignment under load, and insist that the trucks and transfer cars are roller bearing. Make certain that the curtains or doors are absolutely tight and durable. See that you get the best of fittings, such as valves, traps, thermometers, hygrometers, etc., and have the piping large enough to permit of the use of exhaust steam, if necessary. Lay your plan out carefully, and use it on paper for a while before driving a nail. Put an intelligent man in charge of it, and watch him.

Question.—Can you give us the names of any manufacturers of railway shims?—Canadian Flax Mills, Limited, Drayton, Ont.

Answer.—The Paget Grain Door Company, Limited, manufacture railway shims at their factory at Goderich, Ont. Their head office is at Huntsville. Mr. Charles E. Paget is president.

A British firm desires to get in touch with manufacturers of maple rollers for mangles. These goods are imported turned in the rough or shaped octagonally.

News and Notes

The Shurley-Dietrich's, Limited, saw and bed plant was burned down early in the morning of February 6, with a loss of about $250,000. The entire plant excepting a newly-erected brick warehouse was destroyed. The loss is partially covered by insurance.

The sum of $65,000 is included in the estimates for improvements to Rideau Hall, the official residence of the Governor-General at Ottawa. The improvements include various items in connection with the grounds and also the purchase of certain furniture.

In Bulletins 303 and 504 issued by the Canadian Machinery Corporation of Galt, Ont., as an addition to their woodworking tool catalogue, we have an interesting description of the 303 heavy moulder and the 504 tenoner. The former is the company's latest type of heavy outside moulder mounted on a substantial base and is one which is recommended for all classes of work. The latter is designed for light and heavy tenoning and is also a high grade machine for general requirements.

Mr. William Miller has discontinued his connection as Secretary of the firm of Henry Disston & Sons, of Philadelphia, after a service of 37 years with that company, and on February 1st associated himself with the Simonds Manufacturing Company, Fitchburg, Mass., and Chicago, Ill. Mr. Miller is one of the most experienced and efficient men in the saw, knife, and file-making business, and probably no one man is better known among the hardware jobbers and dealers and saw millmen throughout the United States and Canada. He has been successful throughout his many years in the saw-making industry, and he brings to the Simonds Manufacturing Company a conscientious desire to see that customers are furnished with goods of the highest quality. He has already taken up his new work at the executive offices of the Simonds Company in Fitchburg, Mass.

Finishing Touches

Disposition

One of the big railroad lines has a regular form of reporting accidents to animals on its line. Recently a cow was killed and the track foreman drew up the report. In answer to the question, "Disposition of carcass?" he wrote: "Kind and gentle."

Brave to Recklessness

Amy Teur—"I thought, my dear Count, that you were a judge of music. I wonder at the applause you bestow upon that man's efforts; his singing is abominable."

Count Dorame—"Ah, madame, it is not his voice I so admire. It is his bravery. Bravo! Encore!"

Wanted No Amateurs

Edith and Flora were spending their vacation in the country.

"Do you know," said Edith, "that young farmer tried to kiss me. He told me that he had never kissed any girl before."

"What did you tell him?" asked Flora.

"Why," replied Edith, "I told him I was no agricultural experiment station."

Had Good Cause

"When I was shipwrecked in South America," said Captain Bowsprit, "I came across a tribe of wild women who had no tongues."

"Mercy!" cried one of his listeners of the fair sex. "How could they talk?"

"They couldn't," snapped the old salt. "That's what made 'em wild."

Personalities

While James McNeill Whistler, the eccentric painter, was trying on a hat in a London shop one day, a customer rushed in, and, mistaking Mr. Whistler for a clerk, exclaimed: "I say, this 'at doesn't fit." The artist eyed him for a minute, and then replied, scornfully "Neither does your coat, and I'll be hanged if I like the color of your trousers."—Argonaut.

Why They Chose Him

"Now, min," said the Irish foreman, after the accident, "we will hov t' hov some wan t' break th' news gradual t' Mike's woife. Who will we sind?"

"Sind Hanrahan," said Casey; "he's just th' mon t' break it gradual. Look how he sthutters."

Knots and Slivers

"He has discovered a new species of fruit." "What is it?" "He says it is found on roof gardens. It looks like a peach but is really a lemon."

A woman's problem is what to wear—man's how to get it.

Many a man puts up a perfectly good bluff and then falls off the edge of it.

The aviator's fears are not always groundless.

"Life is full of trials," mused the pessimist. "I don't care," said the optimist, "so long as I am acquitted."

Loose habits generally lead to tight places.

Two men were hotly discussing the merits of a book. Finally one of them, himself an author, said to the other: "No, John, you can't appreciate it. You never wrote a book yourself."

"No," retorted John, "and I never laid an egg, but I'm a better judge of an omelet than any hen in the State."

Machinery and Equipment

The Aeron System as Applied to the Woodworking Plant

IN these days of efficiency and scientific management, any new process which gives promise of reducing costs is investigated with interest by the progressive manufacturer. The Aeron System of finishing has been adopted during the past two years by several hundred woodworking plants in the United States and by a few in the Dominion, after having been investigated and found to effect a material saving.

The method consists, briefly, in spraying stain, shellac varnish, or enamel, as the case may be, on the work by the means of compressed air, under a pressure varying from 30 to 80 pounds per square inch. The hand brush, is almost entirely eliminated, being used only to apply the filler which is handled in the usual manner.

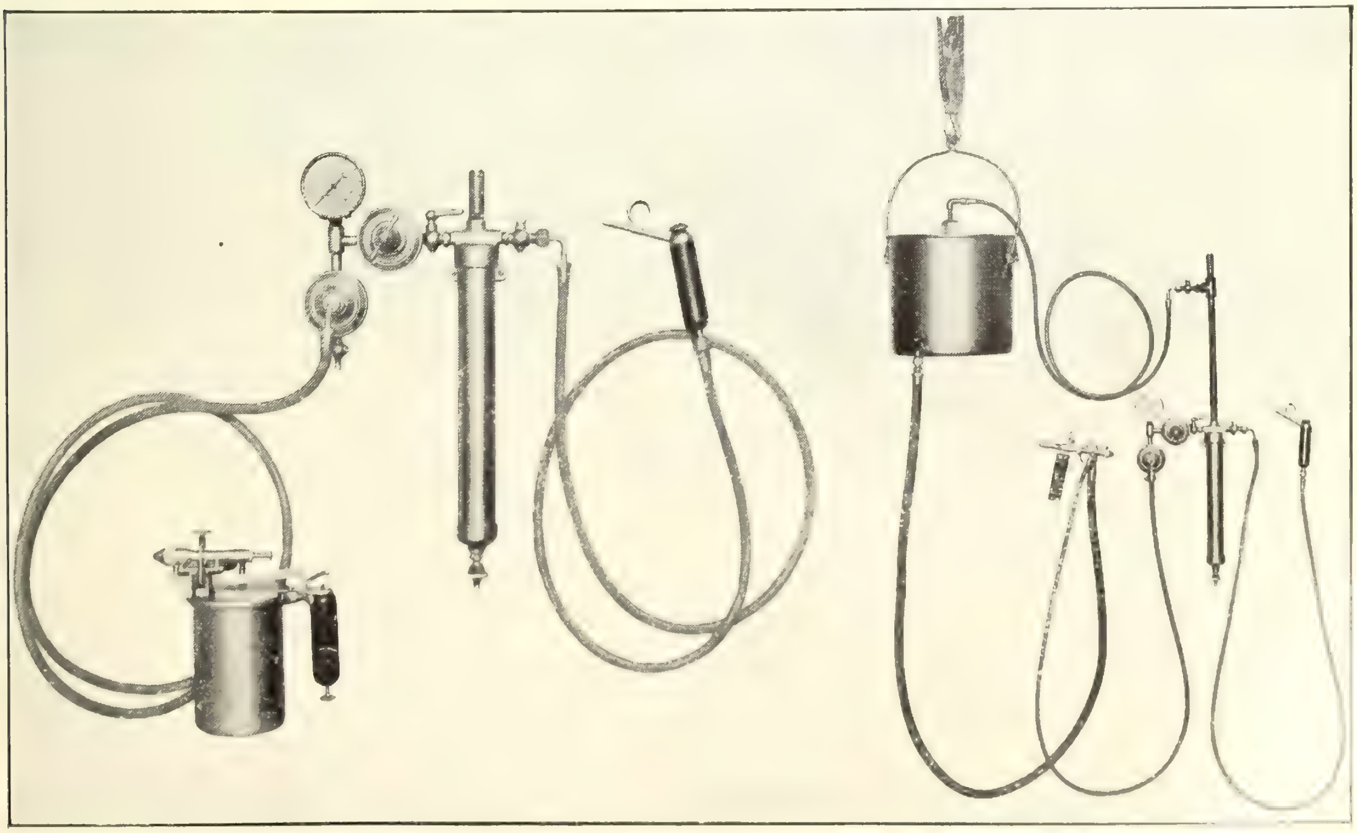
The necessary outfit comprises, the Aeron itself—which is made in two styles and several sizes, the air compressor and receiver, an air transformer set for regulating the pressure and purifying the air supply, a booth or cabinet in which the work is done and an exhaust fan to dispose of the vapors or fumes resulting from the atomizing of the finishing material. Besides these necessary appliances, turntables are used where advisable to facilitate the handling of the work while the "aeroning" is done.

The two styles of Aerons are shown in the large illustration each connected with an air transformer set to which the air supply pipe is attached. In one style of Aeron the finishing material is carried in a pint or quart capacity cup forming a part of the Aeron itself. The other machine takes its supply from a five gallon container above the nozzle. The second photograph shows an operator using the process on a dresser. The work is placed in a booth on the turntable which can be tilted to any convenient angle and revolved by hand, and is coated on the top, sides, and front with the drawers in place. Drawers may also be finished inside by this process.

It will be noted that it is not necessary to coat the top separately and the sides in a horizontal position, allowing time for one side to set up before coating the other, in order to obtain a full bodied application. All surfaces that are to be finished can be coated in one operation, as it is possible to put on a heavier coat with the Aeron than with the brush without danger of sags or runs. This, of course, refers to varnish, chiefly coach and gloss, where a full body and high gloss must be obtained with as few coats as possible.

The statement that a full coat can be applied to a vertical surface as well as to one lying in a horizontal position demands an explanation. There are two reasons. It is impossible to put on a perfectly uniform coat with a brush, especially on a vertical surface, and runs and sags are caused by the heavier portions of the coat dropping down over the lighter coated spots.

With the Aeron a uniform coat of varnish is applied, and it is a fact that as the coat is the same over the entire surface it will not run, even if it is as heavy as a brush coat which would show sags. The second reason is that an Aeron coat sets somewhat quicker than a brush coat, owing to a slight evaporation of the solvent caused by the action of the compressed air. Again since the coat is uniform it sets uni-

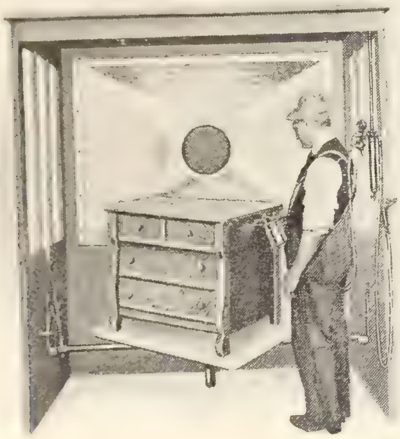


Two styles of Aerons, each connected with an air transformer set to which air supply pipe is attached.

formly. For the same reason the final drying is hastened to some extent.

In brushing flat horizontal surfaces, where a heavy coat is applied, it is almost impossible to avoid fatty edges, and in brushing carved or ornamental relief work, the low spots are sure to collect more varnish than the high places. Corners and edges in panel work are also causes of difficulty in this respect. In using the Aeron the surface varnished is covered uniformly and evenly, whether flat, paneled or carved, with one sweep of the machine at an even speed. Consequently heavy spots, runs and fatty edges are entirely avoided.

In applying finishes with the Aeron a slight reduction of the material with turpentine or other solvent is logical, with some materials necessary. Reducing is logical on account of the slight evaporation of solvent previously mentioned. In other words, in order to have the Aeron application of the same consistency after reaching the surface as it is when brushed, a reduction of from 5 to 10 per cent. would be required. This is not always desirable by any means especially in the case of the heavy gloss coat spoken of. Whenever a free flowing coach varnish is used, reducing is not necessary. Conditions in different plants govern this matter to a great extent.



An operator is here seen using the process on a dresser.

Rubbing varnishes are usually reduced slightly, as a full bodied, heavy coat is not required, also because a rubbing varnish does not flow as readily as a coach varnish. On account of the evenness of the coat, an Aeron coat of rubbing varnish is somewhat more easily and quickly rubbed either by hand or by machine. Undercoat varnishes are reduced to some extent for Aeron work for similar reasons. They are also more easily sanded than when brushed. Pigment primers or first coaters are aeroned to better advantage if the pigment content is less than for brushing. It is also sometimes desirable and expedient to use a more finely ground pigment. Flat finishes are applied to great advantage, and because of greater uniformity of surface more closely resemble a rubbed finish than when brushed.

The Aeron offers perhaps greater advantages in the application of shellacs than any other materials. It is a matter of common knowledge that shellac is very difficult to brush, while on the other hand it aerons easily. Instead of cutting the gum 4 or 5 pounds to the gallon of alcohol, as for brushing, the material is used in the proportion of 2½ to 3 pounds of gum to the gallon. The aeroned coat of shellac is perfectly smooth and uniform, and requires practically no sanding compared with the work necessary to sand a brushed coat.

White undercoats and enamels are handled in the Aeron with surprising ease, considering the difficulties they offer in brushing. White brushed finishes require several coats to properly cover a job while in Aeroning—owing to the uniformity of the surface and the absence of brush marks, one or two coats usually can be saved. One coat of white primer put on with the Aeron will cover a piece of work as well or better than two brushed coats. Some very presentable product is being turned out with two coats in satin finish and three coats in gloss, with this system. Highest grade rubbed white work is done in four coats. Brush marks, runs and laps are eliminated and the saving is obvious. Stains and fillers are being aeroned in some factories, but usually the process is not applicable to these materials. When fillers are applied with the Aeron, the unusual rapidity of the drying makes it somewhat difficult to obtain an even shade of color.

The advantage of the Aeron System in obtaining quality of finish and its adaptability to different materials has been discussed. We come now to the consideration of the time and labor element. The saving in time depends upon the material applied, the nature of the work finished and the method of handling the piece. In general it can be conservatively stated that one man operating an Aeron can do a given amount of work in from one-half to one-tenth of the time required to brush the same job. The economy of time is greater with the shellacs and primers, one man being able to do the work of from four to eight men on ordinary case goods or flat surfaces—such as tables. On carved work and the like, the saving is still more. The advantage in time on chair work is great because of the many different surfaces and angles, all of which offer difficulty in brushing. The varnish and enamel coats cannot be handled as rapidly as the undercoats, but the difference in time required with the Aeron and with the brush is nearly as marked as in the case of the undercoats.

The Aeron is simple and easy to operate, and a week's work is sufficient to make an efficient and expert operator of the average man. The work is clean, and what is more, is healthful and sanitary, as all vapors and fumes are removed from the finishing room by the exhaust fan used with each outfit.

Cleaning the Aeron is accomplished by spraying a colvent through the nozzle instead of the finishing material, and the whole machine is placed in a can of thinner over night if desired. It is necessary to clean the Aeron but once a day if it is used more or less continuously. The whole operation of cleaning may be performed in a minute or two.

There is usually some loss in the finishing material when the Aeron is used, though this is hardly noticeable except on small work when it may amount to 15 or 20 per cent. In many cases there is no waste, in others an actual saving—where coats are eliminated by the use of the machine. As an average however there is some slight loss—largely of the solvent used in reducing the material. In any event however the waste is offset many times by the saving effected in time and labor, without taking into consideration the saving in floor space, the greater ease in handling the work, the better quality of the work done, the advantage to the workmen, and finally the general all round convenience of the Aeron system.

The Aeron system is patented and handled by the De Vilbiss Manufacturing Company, of Toledo, Ohio., to whom enquiries should be addressed for further details and quotations.

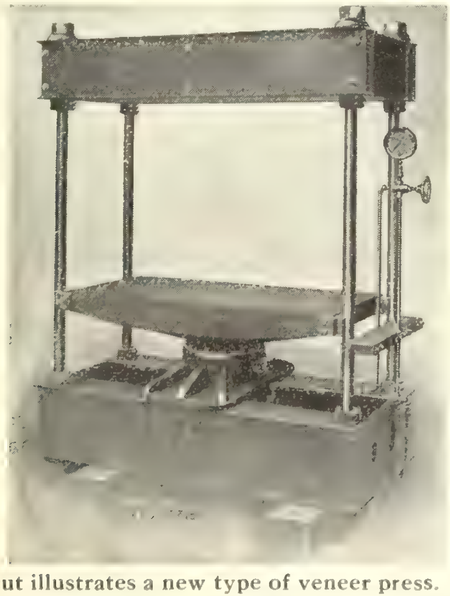
It is with pleasure we announce and show in this issue the latest model Circular Saw Guard manufactured by Bass Brothers of New York. At the recent exhibit held at the Grand Central Palace under the auspices of the American Museum of Safety, where this guard was exhibited, it was the consensus of opinion that it was the most practical and fool-proof upon the market. It is entirely automatic and self-adjustable and lumber when going through the saw will automatically raise the guard and allow it to drop back into place over the blade when the work is completed. All unnecessary and clumsy arrangements have been eliminated, thereby greatly reducing the mechanic's risks. It is adapted for up-end work, dado and grooving, for which adjustment can rapidly be made.

Open Side Hydraulic Veneer Press

The accompanying illustration shows a new type of veneer press, designed and built by the Hydraulic Press Manufacturing Company, Mount Gilead, Ohio. A great many veneer manufacturers prefer the open side type of veneer press and with this in view this press was designed. It is of the single cylinder and one platen type.

This design of veneer press is suitable for handling stock either with or without trucks. The most approved method of retaining the pressure on the stock is employed in connection with the operation of this press. An independent retaining system is here provided and it supplies a simple method of clamping the stock so that the package can be removed from the press as soon as the retainers have been set. The retaining clamps for this system are made of steel and have sufficient strength to keep the material straight and prevents the package from expanding . The package is handled in and out of the press by the latest labor-saving methods.

This press has a pressing surface of 36 x 72 inches and will admit a package of stock 36 inches in thickness. Steel and semi-steel is used throughout in the construction of this press. The ram is 12 inches in diameter and has a run of 18 inches. The cylinder is made of a one piece steel casting.



This cut illustrates a new type of veneer press. It is of the single cylinder and one platen type, and the most approved method of retaining pressure on stock is employed.

This press is built strong and durable throughout and is capable of giving long and hard service. It is merely one of the many designs of veneer presses built by the Hydraulic Press Manufacturing Company, who have been building hydraulic presses successfully for the past thirty-seven years. Special hydraulic presses and pumps for all high pressure purposes are designed and built by this company.

The Gibbard Furniture Company is contemplating the erection of a new furniture factory at Napanee, at a cost of $10,000.

The Practical Efficiency of Automatic Sprinklers

THE Automatic Sprinkler is a mechanical device designed to eliminate the element of human uncertainty in the discovery, control and extinguishment of fire, and it is undoubtedly the most efficient fire-fighting device yet evolved.

Its value to the community in general and to that section of the community reading this magazine in particular, lies in this fact—that it is the most potent factor at our command in solving the problem of the terrific economic waste occasioned every year by fire.

It is not our intention here to give a detailed and technical description of automatic sprinkler equipment. It is sufficient to describe the automatic sprinkler as a water valve and distributor, designed to open automatically under the influence of heat and depending for its action on the melting of a fusible link. An abnormal rise in temperature occasions the melting of this fusible link which sets into play the mechanical properties of the device and results in the opening of the water valve. A stream of water under pressure is then directed against a distributing cap immediately above the waterway and is sprayed over the area surrounding the sprinkler head.

The sprinklers are spaced in such a manner that practically every part of a protected building is under the control of the operation of at least one head. The outbreak of fire is immediately localized and if not extinguished is held in check by the operation of the sprinklers in its vicinity. In addition the sprinkler system provides an automatic alarm of fire by setting into operation an alarm gong immediately upon release of pressure at any of the sprinkler heads and thus has the functions of an ever present and ever vigilant watchman.

Sprinkler systems are designed to meet varying conditions. Thus in buildings which are not heated and in which a piping system filled with water would be liable to freeze in winter an installation known as a "dry" system may be installed. In this case the piping system is subjected to an air pressure which has the effect of keeping closed a "dry pipe" valve installed on the water main. A drop in air pressure occasioned by the opening of a sprinkler head opens the "dry pipe" valve, releases the water and calls into effect all the functions of the system. Similarly "outside" sprinklers are designed for installation over windows, eaves, and those portions of a building which are subject to fire exposure from neighboring structures. Their operation creates a curtain of water over the exposed area and constitutes an efficient preventive against fire originating outside of a building.

The practical efficiency of the automatic sprinkler in the control of fire is not merely a matter of theory. The record of sprinklered risk fires compiled by the National Fire Protection Association covering a period of 14 years shows that of 10,171 fires listed, 64.25 per cent. were entirely extinguished by the action of the sprinklers and that 30.59 per cent. were held in check to such an extent as to permit of extinguishing without serious damage by other means, thus presenting a total of 94.84 per cent. to the credit of the automatic sprinklers for successful operation in holding in check or totally extinguishing fires, the remaining 5.16 per cent. of the whole representing unsatisfactory operation of the device due either to lack of proper water supply, serious defects of antiquated equipment or on account of the equipment being rendered inoperative through the cutting off of its water supply accidentally, carelessly or otherwise.

From an economic viewpoint and considering the imposing record of fire loss which confronts the community with the close of every year, the above figures should leave no room for questioning the appeal for widespread adoption of the automatic sprinkler an as agent in preventing fire loss. To the business man also the automatic sprinkler makes an equally imperative appeal presenting a proposition in cold figures which cannot be evaded.

The National Board of Fire Underwriters have endorsed this proposition to the effect that an investment of capital in sprinkler equipment will yield direct returns of 15 per cent. to 50 per cent. and in some cases considerably higher.

Those of our readers desirous of obtaining further information or quotations on sprinkler systems are invited to get in touch with Messrs. Keiths, Limited, 111 King Street West, Toronto.

Development of Side Heads

THE introduction of the Shimer Cutter Head, some forty years ago, marked the beginning of a new era in matching lumber. Previous to that time the product of no two mills in the country would match into the same floor. It was only after the introduction of these time and labor-saving tools that the several lumbermen's associations adopted certain proportions as the standard tongue and groove for certain thicknesses of flooring. Soon builders in making up their orders began to specify that the flooring to be furnished was to be matched with Shimer Cutter Heads. To-day standard sizes have become uniform.

The use of hardwoods in house-furnishing and other lines has also been constantly growing until now nearly every section of our country is contributing some wood of a hard or tough nature for this purpose. The fact that these woods take a handsome natural finish, are more serviceable, especially for flooring, has rooted them so firmly in the popular demand that we doubt if they will ever go out of use. How to work them economically with the tools at hand has however, been a serious problem with the wood-worker who desired to turn out good work at a fair margin of profit.

To meet this demand and to keep up with the race for supremacy among the makers of fast feed flooring machines, the manufacturers of the Shimer Cutter Heads brought out the line known as the "Shimer Limited." These tools possess many features of special merit and are made with four, six, eight or twelve bits to each head to suit the matcher upon which they are to be used, the feed desired and the kind of material to be worked.

In appearance the "Shimer Limited" series of Cutter Heads resemble the older patterns of these famous tools, but differs therefrom in the method of attaching to the spindle; in the construction of the bit seats; of the bit designed for faster cutting; in the greater strength of the holding bolts, and in the self-centering device which clings to the spindle when drawn up, securing it firmly thereto.

The spindle gripping device is positive and effective in its purpose of holding fast to the spindle, as also in centering the head for a more uniform action of the cutters. This is accomplished by having the central bore of the head tapered and having a rotatable cap and nut fitted in the upper portion. Into this bore a taper collet projects having an upper threaded portion fitting the rotatble nut. When the top nut is drawn up the collet contracts and binds itself firmly to the spindle. This device is simple and effective and one not likely to get out of order. The various parts are made of good steel forgings and the collets are hardened and ground true to size. The entire construction of this tool is the finest, both in workmanship and material.

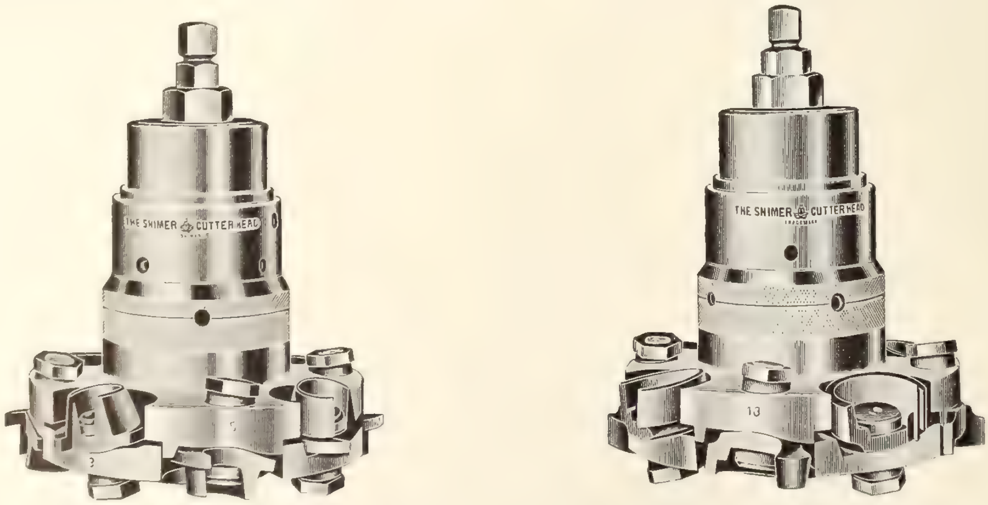
The bit seats in these heads carry a larger surface, and the bit chambers are of greater depth, to compensate for the new acute angle given to the bits for greater relief to the parts coming in contact with the lumber. The holding bolts have been strengthened several times over by the use of a high grade steel especially made for the purpose.

All cutting bits are of high grade tool steel, tempered to file. They hold an edge exceptionally well in working wood of every class and their circular outlines maintain uniform shapes and patterns of the finished product. No filing or fitting of the parts other than that required to sharpen the bits, which requires about the same skill as that of filing a saw.

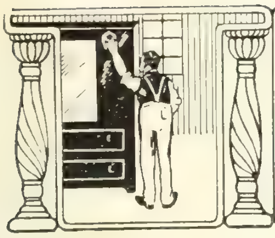
To match flooring at the rate of 150 to 250 lineal feet per minute requires side heads of perfect balance, and of undoubted strength, to withstand the enormous centrifugal strains and the hard knocks incident to matching all kinds of lumber at fast feeds.

The "Shimer Limited" Cutter Heads are made from Solid Steel Forgings of 60,000 lbs. tensile strength, which are shaped under a powerful steam hammer until the grain is further solidified and refined, making a tool which has no equal for strength. They are carefully balanced and the bits are jointed to insure all of them doing their share of the cutting.

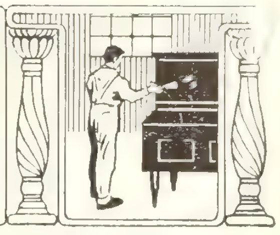
These tools must be seen at work to be appreciated. Like all Shimer products they are sent on trial, returnable if not satisfactory. Send for a set and give them a try out on your fastest machine. Address Samuel J. Shimer & Sons, Galt, Ont.



The "Shimer Limited" with eight bits to each head and the expansion feature.



THE FINISHING ROOM



Producing the Various Kinds of Mahogany Finish

Contributed by Walter K. Schmidt

THE Foreman Finisher's troubles are in producing stain and obtaining results with the various stains. . After he gets the correct stain mixed up, or purchased, he has got to be responsible for its application. For instance, in mahogany, so often you will find a piece of furniture made up of solid mahogany, veneer and birch, to say nothing at all of the gum wood combination. The stain will penetrate the mahogany deeper than it will the birch, producing two shades. For a man who wants to know, there are methods for giving the same stain more penetrating power so that the workman, by having a separate pail of the same stain for use on birch, can stain the one piece and have a uniform color. This is a far more satisfactory method than going over the work twice. The staining is all done at one time. Where an attempt is made to go over the work twice the results are apt to be blotchy. It consumes more time, and time is a valuable article.

A most valuable formula which will tend to standardize the operations of the finishing room were worked up by the writer, and are successfully employed by a good many factories. The formulas act as a basis from which in later operations other formulas required to match certain special shades can be made.

For the standard solution use:

No. 1 stain:—2 lbs. ½ oz. bichromite of potash to 6 gallons of hot water.

No. 2 stain:—14 oz. mahogany red, 12 oz. mahogany brown, 6 gal. water.

No. 3 stain for mahogany:—1 gal. 7 pints No. 1 stain, 2½ gal. No. 2 stain, 5 gal. water.

No. 4 stain for birch to match mahogany:—½ lb. bichromate of potash, 12 oz. red mahogany powder, 12 oz. brown mahogany powder, 6 gal. hot water.

No. 5 stain for Toona veneer:—1 oz. caustic soda, 2 gal. water, 2 oz. spirits of nitre, 1 fluid oz. No. 2 stain.

For Toona color on birch, use No. 2 stain diluted to match mahogany, and then go over with No. 5.

For solid mahogany, use No. 5, double strength, that is, use but one gallon of water and the same amount of the other ingredients.

For antique mahogany use ¼ lb. of red mahogany stain powder, ¾ lb. brown mahogany stain powder, 2 gal. No. 1 stain.

For brown mahogany, Adams style, use 5 oz. brown mahogany stain powder, 1 gal. No. 1 stain.

The fillers for these various mahoganies are colored with Van Dyke brown and rose pink. The shade in each case must be determined by the stain employed. For instance, on regular mahogany, use ground silex, made to a paste with Japan and boiled linseed oil, to act as binder. Stir in sufficient quantity of Van Dyke brown ground in oil, and tone up with rose pink ground in oil, then thin with naphtha for use.

For antique mahogany, and brown mahogany, omit the rose pink. On Toona mahogany use just enough of the Van Dyke Brown to make a light brown paste, and a correspondingly large amount of Rose Pink.

My experience in the laboratory has shown that Van Dyke Brown is much better than Burnt Umber. It is more uniform and does not carry with it as much inert matter; and therefore there is a correspondingly smaller amount of danger of the filler settling.

The final finishing of Mahogany is usually done by giving one or two coats of shellac on top of the filler coat, one or two coats of varnish, and rubbing dull.

The quantities given in these formulas are based upon a good quality of what are known to the trade as red mahogany and brown mahogany stain powders. But it will remain to the individual in establishing these stock solutions to determine to a nicety the increase or decrease of the amount of stain powders according to the strength of material at hand. After this has once been accomplished and practical tests made, he must see to it that the same strength of powders are supplied him thereafter.

Should it be that any of our readers are preparing their mahogany stain powders by the use of scarlet, orange and black, it will only be necessary in order to apply these formulas to produce the brown by the mixing of orange and black in a definite quantity which thereafter will be employed as the brown powder of his formula.

More and more is the foreman finisher of to-day continually confronted with some particular and popular shade of finish just a little different than that which he is running regularly. If he knows his color it is an easy matter for him to employ his regular methods and merely change his color material a little to conform with the match.

Manufacturers have tried to standardize their shades and make them uniform. Manufacturers of stains have endeavored to do the same thing. But, alas! it is only too true that the same material employed in two different factories will not always give the same result. Often this can be laid to the filler employed and to the application of the filler, and a good many times to the foreman finisher, who thinks he knows more about it than the man who made the stain. This is not to be laid up against the foreman, however, because he is basing his conclusions upon the facts obtained from experience only. It will be seen, therefore, that with a more intimate knowledge of the materials employed, what they look like and what they should be, he would understand his materials and know how, why and where to remedy mistakes and get results.

The detailed information which has been offered up to the present has been very meagre so that the present condition of the finishing department is only an outcome of tradition.

The trim of a fine residence was oak which was to be treated with a weathered oak stain and rubbed to a dull finish. The furniture which was purchased for the house was mahogany and when installed the conthat was anything but pleasing to the young couple for whom the house had just been erected. The owner, therefore, decided to tear out the oak finishing, casings, doors, etc., and replace with birch. Just at this time, however, it occurred to one of the men employed by the painter having the contract for the work that much trouble might be saved by treating the woodwork to a mahogany oil stain. He therefore rubbed down a portion of the oak and applied the mahogany stain to it with such pleasing results that the entire woodwork was gone over, after sanding down, with mahogany stain and varnished. The effect was a mahogany finish somewhat darker than usual, but nevertheless a very satisfactory job.

Varnish Cracking on Finish of Piano Stools

THE cracking of varnish may be due to one or more different causes, most troubles arising from a poor grade of varnish. But there are others, writes A. A. Kelley in Wood Craft.

Adding driers to varnish is almost sure to cause a very fine cracking, known as "silking," the surface having the appearance of silk cloth. These fine cracks may widen later on, developing into cracks having a very sharp edge, and these will be found crossing the surface in every direction. If driers have been added to the under coats then the cracks will be deep.

It is a pretty good rule to use only one kind of varnish on a job. If a soft varnish is placed on top of a hard one there will be cracking.

Varnish is easily influenced by the weather or conditions of the atmosphere. Cold weather retards the drying and hardening of the varnish. A humid atmosphere will do the same thing. Insufficient light and ventilation during the application of varnish will cause varnish troubles. The degree of heat necessary in the varnish-room is about 72 degrees. Too much heat, however, is not good. Excessive summer heat is worst of all heats, owing to the fact that it carries more or less humidity.

Hurried work produces its sure crop of varnish troubles. Generally speaking, each coat should have at least 24 hours for drying in, some varnishes requiring several days, it depending on the character of the varnish—that carrying much oil requiring longer time than what is called a short oil varnish, or one carrying more turpentine than oil. An elastic finishing varnish may be used over a hard-drying under coat of varnish, but the reverse order to this will not do.

In answering a question such as this, with meager information before us, it is impossible to say in a few words just what the cause of the trouble is, but on the face of it we should guess that a cheap varnish had been used. We know that a cheap grade, carrying little oil and little turpentine, and minus the proper gum, is bound to crack, soon or late, in winter or in summer. The benzine-rosin varnish will crack worst in cold weather because the contraction in drying is more rapid than it is in warm weather.

A Good Rule for Varnishing

There is an old axiom of the varnish-room that the writer has been poking at varnishers for years. Here it is again:

One coat of varnish never cracks.
Two coats of varnish seldom crack.
Three coats of varnish often crack.
Four coats of varnish always crack.

By this is meant that too many coats cause cracking. But given time enough and many more than four coats may be applied and no cracking, as we know from the fact that some vehicles are given as many as a dozen and more coats without giving trouble. It all depends upon the kind of varnish and the way we use it.

The varnish on the piano stools may crack because of a possible aniline stain under it. Or because of a greasy or unclean under surface. Or because of too high a gloss in the under coat. Or because the varnishing was done in a cold or damp air.

Perhaps the varnish was cold in the can. It is a good rule to have both varnish and surface to be varnished of the same degree of heat—that which is obtained in a room having at least 70 degrees.

Applying the varnish in too heavy a coat will often cause cracking.

And it is just as essential that the article, after being varnished, should be left in a warm place until perfectly dry. Many think that after the varnish has been applied the drying will go on all right no matter where it is. But that is a mistake and will cause trouble. The varnish needs warmth all the way along, from the stockroom, where the can is, up to the time it is a coating on some article, and then afterwards too.

Time is Required

But perhaps the most frequent cause of trouble with varnish is haste in its application and not enough time for proper drying. Cheap varnish will answer the purpose of the hasty varnisher better than a higher grade, because the higher grades contain more oil, and hence take longer to dry. Then, to hasten the drying still more, some will add driers, and that causes another sort of trouble.

Having given most of the causes for varnish troubles, it is for our inquirer to make the application himself, for he knows, or should know, just what kind of varnish is being used on the goods. If the grade is right, then he must look to the foreman finisher. That source failing to yield the desired information, we would advise him to consult the maker of the varnish. Indeed, it is a good rule to go to the varnishmaker first and most likely he will send a representative to investigate.

Finally, if you are turning out hurried work, using none too reliable a varnish, and shop conditions are not what they should be, look for all sorts of troubles from varnishings.

A European recipe to freshen up time-deadened polish on wood is as follows: Melt about 50 grams of stearine in a dish and mix with 70 grams of oil of turpentine. When these 5 to 7 parts are mixed, a paste-like mass forms which can be rubbed on the furniture with a woolen rag and will return the old brilliant finish to furniture.

Veneered work is now being regarded as a fancy product, and not merely an effort to economize in fine face wood.

Finishing Birch to Resemble Mahogany

The occasion not infrequently arises where it is desirable to finish birch in a way to resemble mahogany, and the following method may not be without interest to some of our readers.

Birch, especially the black variety, will, when properly stained, make a very fine imitation of black walnut or mahogany, being of fine grain. By manipulation of several stains feathered mahogany can be closely imitated on birch. It is first stained and may be filled with mahogany colored paste filler afterward, which will bring out the details with better effect. On top of this filler two coats of shellac varnish, when sand-papered, will give an excellent surface for polishing.

As birch has almost the color of cherry wood, a very strong stain is hardly necessary, but for work that is to be filled and shellac varnished and afterward polished, we would suggest the use of a rather fast drying oil stain, made from burnt sienna and rose pink, both ground fine in oil.

Twelve ounces burnt sienna in oil and eight ounces rose pink or maroon lake in oil, beaten up with one quart liquid drier or japan, to which is added one pint of good inside varnish and one-half gallon of turpentine, will make one gallon of mahogany stain that will dry reasonably quick and should serve an excellent purpose.

Process for Fuming Oak

IT is a well-known fact that the fuming of oak is done by the vapors of ammonia which act on the tannic acid in the oak, producing the uniform brown color that cannot be obtained with any water, spirit or oil stain in its soft effect. Another advantage of fuming oak is that the grain of the wood is not raised.

If the articles to be fumed are of moderate size an air-tight case or box fitted with racks on which to put the pieces of wood is placed with the open end on a level floor, on which are a number of shallow porcelain or glass dishes filled with ammonia of 26 degrees Baume. The articles are allowed to remain in this apparatus until they have assumed the desired color. When the articles are large, such as furniture, they should be placed in a room of suitable size that must be practically air-tight by having windows and doors securely fastened. There should, however, be a pane of glass in the door, through which observation as to the progress of the fuming may be had without opening the room until the process is complete.

In a room of 12 by 16 ft. the distribution in suitable dishes of one gallon of 26 degrees ammonia over the floor of the room will be sufficient if the room is kept closed for about twelve hours. The articles to be fumed must be so arranged that the ammonia vapors can circulate freely about the surface that is to show the effect of treatment. When the articles are taken from the room or other apparatus they should be given a good airing in order to have the vapors evaporate previous to finishing the wood with wax or paste filler and matt varnish, which is the only proper finish for fumed oak articles of furniture.

When the fuming process is not practicable the effect can be obtained by attaching a sponge to the end of a stick, dipping it into 26 degrees ammonia and so applying it to the surface. Of course, in this case the grain of the wood will be raised more or less and make sandpapering necessary before finishing, as above noted. A solution of bichromate of potash in water, say two ounces of the potash in three pints of water, if applied repeatedly over the surface, will also produce a fumed oak effect. Still better is a wash made by dissolving one ounce of catechu (gambier) in thirty fluid ounces of hot water, permitting the wood to dry and then brushing it over with the bichromate of potash solution referred to above. While these washes do not give quite as good an effect as fuming, they are far better for the purpose than an oil or spirit stain.

Drying Oils and Volatile Oils

DRYING oils used in paint are chiefly linseed oil, China wood oil, sunflower seed oil, hemp oil and menhaden, or fish oil. Such semi-drying oils as corn oil, cotton-seed oil and soya bean oil are also used. Poppy seed oil and nut oil, owing to their paleness, are used in special paints where whiteness is essential, but being high priced, slower drying and not so durable as linseed oil, are not otherwise used, except for artists' colors. Heavy mineral oil to which rosin is added is used as an adulterant in paints.

Linseed oil is the chief and most satisfactory paint oil used by painters and paint manufacturers alike. The other oils mentioned are used almost entirely by paint manufacturers, and are mentioned here to show the painter, that after all, he has pretty nearly the ideal paint oil in linseed oil. Linseed oil is most abundantly obtainable of any of the drying oils, hence, moderate in cost and generally understood. It dries more quickly and uniformly than other drying oils, producing a very durable, waterproof, element-proof film.

China wood oil, when especially prepared, forms a very good paint oil, producing a denser, less spongy, more waterproof film than linseed and other drying oils. The use of this oil as a paint oil is still the subject of experiment, however, although it is widely used as a varnish oil.

Hemp oil is one of the least objectionable of the substitutes for linseed oil. Sunflower seed oil is not very widely used owing to its cost and inferior drying properties.

Menhaden or fish oil, owing to its fishy smell, is undesirable for use in interior paint. It is widely used for smokestack paint, as it will not blister or peel under heat as readily as linseed oil.

The semi-drying oils, corn oil, cotton-seed oil and soya bean oil, after being specially treated to increase their drying properties, are used in connection with the drying oils with strong drying pigments. Of the semi-drying oils, soya bean oil is perhaps the least objectionable.

The chief volatile oils or thinners used in paint are turpentine, wood turpentine, turpentine substitutes, benzine or naphtha, benzol, toluol and solvent naphtha. Between regular turpentine, which is the product of distillation of the sap of pine trees and properly refined wood turpentine, which is distilled from pine wood waste, pine stumps and roots, there is scarcely any difference except in odor.

Turpentine has far better solvent powers than benzine or turpentine substitutes. Turpentine substitutes are heavy petroleum distillates, evaporating just as slowly as turpentine does, with a mild odor. They are just as good as turpentine except in solvent power, as before mentioned, and the slight effect that turpentine has on the drying of the paint. Benzine is lighter petroleum distillate than turpentine substitutes, evaporating more quickly, hence not so valuable nor so widely used.

Benzol, toluol and solvent naphtha are all of similar properties, all three being distillates from coal tar. These materials penetrate wood with great ease, making them valuable as an additional vehicle in the first coat on resinous or greasy woods to facilitate the penetration of the priming coat.

Finishes used in Car and Truck Work

TO handle automobile and truck work at the least expense the paint shop should be located on the ground floor, and besides being easily accessible it should be equipped with all the windows and light-inviting devices possible. Of course, ventilation must not be neglected. Good, fresh air means quick, sure and uniform drying of the paint and varnish coats. Light, after a few hours' housing the freshly varnished work in a perfectly dark room, promotes the drying of varnish to an extent scarcely equalled by any other known agency.

In doing car and truck work, and especially the former, a class of varnishes somewhat different in composition and drying qualities from those employed upon horse-drawn vehicles will be in order. These varnishes are made especially to dry promptly with a high, rich gloss, and to resist to a fairly remarkable degree the action of mud, oils, soaps and alkalies generally. Chassis varnish is also made warranted to resist absolutely the destructive action of soap, mud, water, grease, oils, etc., and to retain its luster under usage which to the ordinary carriage varnish would mean rapid and sure destruction.

In the matter of colors, while a wide range of shades and tints are in evidence, the number of generally used colors is not large. Dark, rich blues, greens, browns, grays, maroons and some of the lake pigments describe the principal pigments. The flashier colors predominating a few years ago have practically all disappeared.

The interior finish of the larger type of car, such as the limousine and limousine-landaulet, is now usually of natural wood. Very beautiful effects are produced in mahogany and some of the rich dark woods. All these woods must, of course, be very carefully filled with a material stained to meet the share required, and then given at least one coat of orange gum shellac, and anywhere from three to four coats of rubbing varnish. If the natural wood interior is to be finished with a polished effect the last coat of varnish should be polishing varnish. For a dull rubbed finish omit the polishing varnish and use a straight rubbing varnish. When the varnish is hard rub with water and pumice stone flour, finish off with a gentle rub with rotten stone, and clean up with a renovating liquid or oil and dry off nicely with waste.

When the polished effect is desired first rub down with water and pumice stone flour and then with some reliable polish proceed to rub to a high, hard gloss, proof against hand and finger marks. Spirit off with a spray of alcohol and the work is complete.—The Modern Painter.

Electric storage battery locomotives are now in the field as lumber haulers in large yards. As their operation is extremely simple, they present a proposition that is well worth the consideration of manufacturers whose plants include extensive yard capacities.

VARNISH BRUSHES

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue

MEAKINS & SONS, HAMILTON, ONT.

Announcement

FOR years gone by we enjoyed a loyal patronage of some of the leading furniture manufacturers of Canada not because our prices are right but for the **better reason** that the **quality** of our **stains** are **unit** and give that feeling of confidence and satisfaction that makes permanent patrons and profitable ones. When buying the **Schmidt Quality kind** you always **know** that your products are going out with a finish that cannot be surpassed.

Write for our Stain Booklet and have it on your desk for immediate reference at all times.

Walter K.
Schmidt Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

Valuable to Every User of Glue

The Glue Book

What it Contains

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

Ask for our special offer.

Woodworker Publishing Co.
Limited
Nicholls Building, TORONTO

"50"
FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and **does not show brush marks.**

R. C. Jamieson & Co., Ltd.
Established 1858
Montreal Vancouver
Owning and operating P. D. Dods & Co., Limited
OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

Choosing the Proper Tension Gage

THERE are a great many things to be taken into consideration in determining the proper tension gage to be used on a saw. The condition of the wheels, I believe, is the first and most important thing to be considered. And right at this point is where the advocates of certain prescribed back gages go wrong. But I will not digress from the subject of tension gages further than to state that the condition of the wheels determines conclusively the proper back gage to be used.

In speaking of the conditions of the wheels I mean the extent to which they are worn, or, if not worn, the condition they are in after being ground or turned, as the case may be. The same applies to new wheels from the factory. Of course, the latter are supposed to be perfectly true, and generally are, but a practical test will determine that. To make an accurate test tie the end of a steel tape on face of wheel at front edge, with a cord. Then turn wheel till the end of tape comes around and note exact circumference of wheel. Then move the tape to back edge of wheel and do likewise.

If the wheel is perfect, or of same circumference back and front, the problem is much easier—there is not so much to be determined in the way of finding the proper gage to be used, both for tension and back of saw. I mention the back because the length of back is quite a factor in the fitting of saws, and must be taken into consideration in determining the proper tension to be used. In fact, the saw itself determines the proper gage to be used, according to the individual choice and view of the man who is taking care of the saw. He may prefer to fit his saws with as much tension as they will hold safely—in fact, so much that he has to weight them down to level them. Another filer, who may be equally successful, may prefer much less tension, in which case the saw will lie perfectly flat on the bench, of its own weight.

Getting Required Tension

The question might be asked, why can one man get the same results with a low tension that others get with high tension, when tension is supposed to be the prime factor in the efficiency of a saw? The answer is in the difference in leveling of the plate in some instances, in the shape and care of the teeth in others, and very often in both combined. An old filer can tell you, in an off-hand way, approximately the gauge to be used on a certain saw in the majority of cases. But in the absence of any knowledge of true conditions, he may be away off on any one of them.

The filer who has an assortment of gauges simply selects the gage best suited to his work on the particular saw he is fitting, of whatever width it may be. Whether it is 30, 40 or 50, signifies nothing to him. His gages are numbered for convenience and saving of time in selecting, more than anything else. Putting it in another way, a filer tensions a saw, after which he concludes it has not tension enough. He goes over it with another gage, with more satisfactory results. Now, the gage he first used did not tell him that he did not have the required tension; the condition of the saw itself conveyed the information to his practical mind.

The gage is simply a tool by which the filer is governed in doing his work in a uniform manner. Give me a set of gages ranging from 25 to 50-ft. circle, and number them 1, 2, 3 and so on, and they will answer my purpose. In fact, I worked for years with gages without a mark or number of any kind on them. The only way I distinguished them was by general appearance. In case of a mix-up, I compared them with the templates, of which I had one for each.

The length of the back of the saw is another condition which must be taken into consideration in determining the proper tension. Some fitters prefer much longer back than others. This is evidenced by communications in The Wood-Worker, recommending backs ranging from 1-64-in. to 1-16-in. long in 5-ft. The back proposition is the same as the two filers getting the same results, one with high tension, the other with low tension. The filer with a back in his saw 1-64 in. long will require considerable tension, possibly all the saw will hold. The one with his saw 1-16-in. long would not require nearly so much tension to get the same results. Nor would it be safe for him to carry so much tension, on account of his saws cracking from excessive strain—the back being so long puts an undue proportion of strain on the front edge.

Method of Tensioning

Another consideration is the method of tensioning. Some tension what is called from edge to edge, dropped to a true circle. Others use what is called the drop quarter tension—that is, the gage is fitted to a smaller circle at the quarter than in the middle. But this is a dangerous method unless in the hands of an expert, and he must be very careful in tensioning near the edge. Other filers use the tire system of tensioning, of which there are some variations, according to the notions of the man using it. Still another system is tensioning from edge to edge, with a tight centre.

All those different methods call for a different circle to get the same results. For instance, tensioning with a drop quarter gage, 50-ft. circle in the centre, will produce results equal, I consider, to a gage anywhere from 40-ft. to 45-ft. circle—depending somewhat on the drop at the quarter of the first mentioned gage—tensioning from edge to edge. In tensioning with the tire system considerably more tension is required than with either of the above-mentioned methods. Or, putting it in another way, a saw that you can tension to a 50-gage from edge to edge, you can easily tension to a 40-gage with tire.

So far we have been considering saws running on perfect wheels. But how many saws are there running on imperfect wheels, and which present more varying conditions, because of the varying extent to which the wheels will wear. Frequently filers of more or less experience have fallen down because of wheels in bad condition, and many have never known the cause of their downfall. Here is where the back gage comes into play. If the back of saw is lengthened according to the wear of the wheel, the saw will require little difference in tensioning from what it did before the wheel commenced to wear. But if no attention is paid to the back of saw, or to the wearing of the wheel, which will necessitate the further lengthening of the back, the filer will find that his saws are not standing up as they were. He will probably tension a little more, and finally some more; and, unless he discovers the source of his difficulties, his troubles will commence in earnest.

It should not be difficult for any man who is interested in the fitting of saws, to understand that there can be no set rule for tensioning any particular saw. Where a 45-gage will suit one man, another will use a 40-gage, still another would use a 35-gage, and all would get approximately the same results.—By W. G. Bean in the Wood-Worker.

Veneers AND Panels

The Veneer Turn-out

By A. K. Racey

ONE of the primary problems of the rotary veneer cutting industry is to establish a dependable ratio of veneer turn-out as compared to board measure feet of blocks and logs. Most all blocks and logs are bought and sold by the thousand feet, board measure. Sometimes the cord may be used as a basis instead of board feet, but this is not often, and finally resolves itself back to board feet measure, anyway, because there is a ratio between cord measure and board feet measure. In making the log scale for board feet measurement allowance was made for slabs and sawdust, and theoretically it represents what a log will turn out when sawed into square-edged inch boards, on the old basis of allowing ¼-in. for saw kerf.

When we take the rotary veneer machine instead of the saw, there is some room for the assumption that the turn-out of available material in veneer should be practically the same as the turn-out of square-edged inch lumber in the saw mill, because the rounding up of the logs in the veneer machine should just about offset the slabs in the saw mill, and the core left in the centre should about offset the amount allowed for sawdust. This is a fine theory and might be worked out very well if all logs were perfect and reasonably round. In practice, however, it will not hold good, and the purpose here is to get some approximate figures based on actual records of veneer machines cutting various products of different thicknesses.

For the present consideration we will take a veneer machine in the woods cutting ¼-in. stock for box shooks, and for the sake of ease of understanding we will use in this instance approximate percentages and round numbers instead of the exact details taken from the actual work. The details in the actual work vary from day to day, anyway, and the idea is to establish something like an approximate average basis for estimating the turn-out.

Let us take, then, the run of machines cutting blocks of small and medium size, say, from 30-in. down to 10-in., leaving an average core of 8-in., cutting on an average 10,000-ft., board measure, per day. With this 10,000-ft. board measure of blocks, if the loss of veneer cutting would just equal the slabs and sawdust in saw-milling, we would have a possible 40,000-ft. surface measure ¼-in. veneer. We find it doesn't turn out this way, however. The core loss will figure 22 per cent. and the end loss 3 per cent.—that is, the loss from trimming with the score knives. This gives us an available product of 75 per cent. of the original figure, which would be 30,000-ft. surface measure of ¼ in. veneer.

This looks a little bad and makes one speculate on how it is and why the loss in cores and end trimming should figure up so much heavier than the allowance for sawdust in cutting into lumber. Part of the explanation of this is found in the fact that there are other slabs beside the outer surface cut away to make the block round. Occasionally the operator will strike a shelly block that will split off into slabs or chunks of wood that cannot be used. Here is a loss that amounts to considerable, and it and the end loss explain why there is more waste in the veneer machine than in sawdust at the saw mill.

We have an available product of 75 per cent. of the board measure. It is not, however, an actual product of this amount, because it is a green product that will shrink considerably in drying, and also there will be some waste in cutting to dimension. There will be some sheets split in the end and bad pieces here and there, and, though some of it may be manipulated in various ways, there will still be considerable waste. This waste may vary from 2 up to 10 per cent. Perhaps a fair allowance, where the utilization is close, is 5 per cent. for an average. From the green available product to the dry product there will be a shrinkage of approximately 10 per cent. in drying, so that with 10 per cent. for drying and 5 per cent. for trimmings, we must deduct 15 per cent. from that available product to get the actual dry product ready to market or to use. If we figure this 15 per cent. along with the other 25 per cent. against the original board measure, it would leave us an actual product of only 60 per cent. However, the correct basis would be to figure 25 per cent. off the original 10,000-ft. to get the available output, which would be 7,500-ft.; then 15 per cent. from this, for the shrinkage and trimming percentage, is really based on the available. That would leave us 6,375-ft. board measure of material or 25,500-ft. surface measure of ¼-in. veneer from 10,000-ft. of logs.

These figures, while they are in round numbers and approximate, instead of the exact figures, are based on tallies from actual work of this kind. Naturally the percentage of loss here and there varies considerably from day today, therefore these approximate figures are really better as a basis for estimating than the actual figures would be, because they are made to approximate average results under the conditions named. It makes it look pretty bad for the rotary-veneer industry, as compared to saw-milling in making lumber, especially when we consider that there is to come another waste. There may be a waste of anywhere from 10 to 30 per cent. in working this actual product up into panels or exact sizes of box shooks for use. This waste, however, is a waste chargeable to further manufacturing, rather than the work of production, and it is a waste that occurs in using lumber as well as veneer.

Here is another thing about it, too, that improves the case for the veneer machine. This product is practically all a good product of specified widths, and perhaps the larger part of the waste is the poor material of the log that would not have made lumber of good grade. Had the same timber been worked into lumber with a saw mill the actual production should ordinarily have held up to the full board measure estimate. Of that actual product, however, perhaps only 50 per cent. would have been good, sound stock, averaging, say, 10-in. in width. The other 50 per cent. would have been lower grade and cull, so that while the saw mill would show the greater quantity, it would not be so much ahead of the veneer product in the point of value, because the actual veneer product is practically clear stock and in shape to be utilized as such.

This outline estimate, it should be borne in mind, is given as a proposition involving the cutting of ¼-in. stock into box shooks. It matters but little whether the work is done with a back roller or the stock is all cut to dimension with a clipper, the actual results will be practically the same in the matter of waste, because in either case there will be necessary the manipulating of half sizes and other dimensions from the original large ones, to get proper utilization of the product. It does not mean, either, that these figures will necessarily apply equally well to other thicknesses in veneer. That is a subject that the writer hopes to take up and treat in additional articles—approximate figures of actual turn-out and waste in cutting veneer of specific kinds and thicknesses, so that the estimate for each kind may stand as an approximate average for that particular kind of product. It is not practical to make any kind of a general average of the rotary veneer cutting industry as a whole, because conditions vary materially at every plant.—Veneers.

What the Buyer of Glue Should Know

By William Stetter

THERE is probably no other industry that consumes or is more dependent on glue, than that of wood-working. In view of this fact it is sad to relate that very little, if any, attention is given to this important question. The wood-worker, as a general rule, merely buys or uses a certain grade of glue because it seemingly answers his purpose in a practical way, and can be bought for what he may deem a reasonable price. His sole object seems to be to get a glue which is fairly satisfactory, at as low a price as possible. Beyond these points his interest seems to lag.

Money is readily furnished for improving nearly every other branch of his business, but the most important of all, the glue branch, is sadly neglected. It seems to be his opinion that it can take care of itself, without any extra help or effort on his part to improve conditions in this line. This is true of almost 75 per cent. of the wood-working factories, and accounts, in a way, for the annual waste of almost $3,000,000 worth of glue by the glue consumers of this country. Experience has taught the writer that ignorance of the workmen in the use of glue is largely the cause, in that they do not know how to obtain the best results. To make them better acquainted with glue and to show them how to get all the adhesiveness and strength that is to be obtained from it, a proper system for buying and handling glue must be installed.

No matter how skilled a workman may be, he cannot produce a high-grade article unless he has the proper tools and facilities. This is true of the glue workman as well as any other. To arrive at a point where the glue question reaches, or nearly reaches, perfection, we must get at the root of the evil; in other words, start at the beginning. The first step toward economizing and improving conditions in this line must be taken up with the buying.

The glue buyer's position is a very difficult one. He should be thoroughly experienced in the practical working qualities of glue, as the value cannot be determined alone by the price per pound. Other things must be taken into consideration, such as water-taking qualities, spreading capacity, strength, etc. For example, let us suppose a manufacturer sends the buyer two samples of glue for wood-working purposes, one at a cost of 12c per pound, the other at a cost of 18c. On the surface this would seem a difference of 6c. between the two grades, but in order to determine which is best adapted for your purposes and which can be used most economically, a careful test of the two must be made.

This is where the buyer commences to get busy. First of all, he must have enough of each sample to make a practical test—about a pound of each. He then proceeds to weigh accurately both the glue and water, starting off at the proportion of one part of glue to one part of water, and continuing to add water until the proper consistency has been reached, noting, of course, the added amount of water which each sample requires to reach the right consistency. Then he applies the glue liquid, which has been heated to a temperature of not over 160 deg. F., to the joints. He next clamps the joints tightly and lets them stand for at least twelve hours, when they are ready for determining the strength. This can be obtained by using a hatchet as a wedge (the edge of which is placed directly in the joint) and forcing it through with a hammer. Naturally the joint that will not allow itself to be opened or split in the joint must be the stronger of the two.

The writer considers a perfect joint one which will not split the wood (provided the wedge is forced directly through the joint) and which will not show a trace of glue where the two pieces of wood have been joined. Spreading capacity can be determined by using a machine spreader, but this is irrelevant, as the glue which takes the most water must have a greater spread, considering, of course, that, it makes a perfect joint. The buyer having obtained and noted the water-taking qualities and strength, is now in position to determine which of the two samples submitted is the most economical.

The result of his tests will be somewhat like the following: The glue at 12c. per pound, in order to obtain a perfect joint, must be weighed at the proportion of one part of glue to one and one-half parts of water. The glue at 18c per pound, in order to obtain a perfect joint, must be weighed at the proportion of one part of glue to three parts of water. With the 12c. glue he can get almost 2½ pts. of glue liquid (figuring a pound of glue when dissolved to be a trifle under a pint) at a cost of 4.8c. per pint. With the 18c. glue he can get almost 4 pts. of glue liquid at a cost of 4.5c. per pint. This shows that the higher-priced glue is the most economical one to use, as it shows a saving of 3/10c. a pint, which equals a fraction less than ½c. per pound.

If the buyer will make these tests and give more attention to this subject, the writer feels confident that not only will a big reduction be made in his glue bills,

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB **Hoffman Bros. Co.** HB

Estab. 1867, Incor. 1904—"Nuff said"

Reg. U.S. Pat. Off.

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS,

1/24 and 1/30 Slice Cut

(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—*SPECIALTY*—

HB **Indiana Quartered Oak** HB

Reg. U.S. Pat. Off.

Sawed Quartered Oak Veneers

WHITE OR RED——HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

but the production of a better article will result. In making his tests the buyer must bear in mind that everything depends upon accuracy. He must rely entirely upon a comparative test, and if he is not accurate in the weighing and measuring of glue and water the tests are not worth the time spent to make them. The appliances used, such as glue pots, brushes, etc., must be thoroughly cleaned. The joint should be heated before applying the glue and the glue should be applied to the joint, as stated before, at a temperature not over 160 deg. F. This is an important point, for if the glue is allowed to reach a higher temperature the strength is being cooked out of it.

Various tests can be made with the different woods with end, edge, flat or rub joints. Then the kind of glue must always be taken into consideration. Hide glues should be used on hardwoods such as oak, quartered oak, mahogany, birch, maple, Circassian walnut, chestnut, etc. A good grade of bone glue can be used to advantage on the soft woods, such as gum, bass, pine, whitewood, etc. Unless the buyer is familiar with the different kinds of glue and able to distinguish the hide from the bone glues, he has to rely entirely on what the manufacturer claims; as a rule, the glue manufacturers are honest in their statements pertaining to the kinds of glue.

There is no accurate way of distinguishing between the bone and hide glues unless the glue should be submitted in the flake, or what is generally known as shell glue. The bone glues, when broken by hand, have a tendency to break readily with very little resistance. The hide glues have a greater resisting power, at times showing a white mark where bent, and, when broken, showing a ragged or rough edge. This is as near an accurate way of distinguishing between the two kinds as is possible to obtain. Where samples are submitted in the ground or granulated form, it is an utter impossibility to distinguish between the two, unless by an expert.

Imported glues are known by their shape, as all imported glues are made in sheet form. There are some domestic sheet glues made, but these are generally made in ribbon form and have a white-clear appearance, as against the imported glues, which are a brown or yellow, some being opaque and others very clear.

The appliances required for making glue tests are very simple and easily obtained. All that is necessary is an accurate pair of scales, ordinary round glue brushes, thermometer registering not under 180 deg. F., a glue pot which will hold about 2 qts., several pairs of hand clamps, a wedge and hammer.

The Cutting of Veneers

Mr. E. L. Wren, manager of the Bromsgrove Guild (Canada), Limited, Montreal, on February 10 addressed the Architectural Association of McGill University on "Wood." He spoke more particularly on the different kinds of lumber used in the construction and fitting up of modern buildings, illustrating his remarks with samples of wood, especially of veneers. Mr. Wren discussed the characteristics of woods in relation to their most suitable use; the method employed in cutting oak and other hard wood, so as to get the best figure; and the cutting of veneers. He also emphasized the point that wood is very apt to shrink and twist, and that all woodwork must be left free to expand and contract; precautions must therefore be taken, in the construction of work, by the use of the five or seven ply or similar methods in order to make these variations in size impossible. This shrinking and swelling of wood were almost entirely due to the dryness or humidity of the atmosphere. Mr. Wren also explained the necessity for proper seasoning and kiln drying, and the methods employed to this end.

Varnish Dry Rooms

THE drying of varnish in a closed room or a room partially closed is becoming very common. Humidity in drying varnish is not properly the vapor of water, as there is no water coming from the varnish, but is obtained by retaining the fumes of the turpentine or naphtha while circulating the air. The addition of any other vapor increases the pressure and lessens its capacity to absorb another vapor. That the operator may properly understand, he should know that if he relieves the room of the vapor coming from the varnish, he should supply vapor of water to prevent casehardening.

A statement in an article in a furniture journal, which would tend to deceive the operator, suggests that "if the manufacturer would heat his finishing room to 100 or 110 deg. at night during the hot months, as well as during cold weather, and make suitable provision for constant circulation of fresh air and removal of foul air, this bad situation would be corrected and an excellent drying condition produced." There are very few factory rooms not fitted with glass, and should the manufacturer supply heat as is suggested and ventilate the room freely, he would find a situation where no condition is changed from that used in the past; neither the vapor from the varnish nor the vapor of water would be held in the room to prevent the rapid drying of the surface during cool nights or days.

What is necessary in drying varnish perfectly, as in drying anything else, is to have a room in which the heat and humidity are controlled in the easiest manner. That the air is not vitiated in the amount of oxygen when circulated by the condensing method—that is, a closed room—can be very easily ascertained, in fact, by simply breathing it. Much of the oil escaping in the ventilated room is oxidized in the closed room, therefore I shall have to differ with the statement that it is practical or economical to turn the entire finishing room into a drying room. The windows deprive the room of both the necessary humidity and also of a considerable amount of heat in cool weather.

It is rather hard to understand how, if one ventilates the room taking outside air, he will prevent the drying conditions continually changing, as the atmosphere itself is continually changing. The trouble has not been in drying the surface of the varnish, but in drying its entire body. I will add this for the benefit of the readers of The Wood-Worker: When the varnish taken from the kiln, being rubbed, sweats, as it is called, it may be replaced in the dryer and thoroughly dry out in this manner. I have the fact from one of the largest manufacturers in the country, that a coat of varnish may be spread each day; and in piano finishing, by allowing the final coat the usual time of drying, two-thirds of the time usually employed in the finishing may be saved. The room itself should be well insulated.—Elmer E. Perkins.

Pencil manufacturers are buying up old red cedar fence rails, in Tennessee and southward, to be made into leadpencils.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1/16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum .
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Dimension Oak Stock

We have an excellent supply of highly figured sliced quartered oak and are prepared to match, joint and tape it for you. This is getting to be quite a feature in our business and we will take pleasure in quoting you prices.

PLAIN AND FIGURED ROTARY-CUT VENEERS

High-grade stock in all woods promptly furnished. Forty-four years of successful manufacturing.

Adams & Raymond Veneer Company

Established 1869 INDIANAPOLIS, IND.

Producers and Manufacturers

MAHOGANY Mexican, African Cuba

CIRCASSIAN WALNUT
(Poti Wood)

East India Mahogany (Andaman Islands)

San Domingo (Direct Importation)

All Imported Woods in

LUMBER and VENEERS

Request our District Salesman to call upon you with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

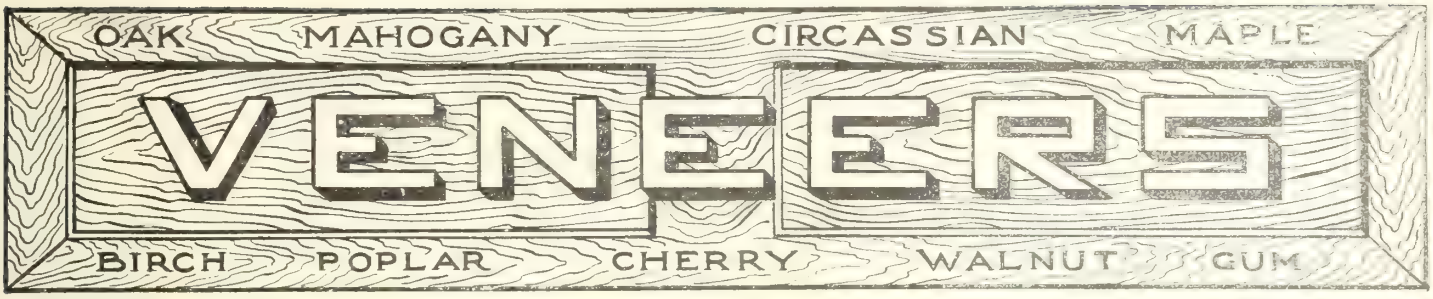
National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,
Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality.

We want your business and know we can earn it.



SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana White Oak Timber and make the best grade of quartered oak Veneers put on the market.

Write Us for Prices

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

We have here in Chicago the most modern and best equipped Veneer and Band Saw Mill in America

The first order will make you our permanent customer—Because:—

We manufacture right, so—
Our product is right.
We carry a large stock, so—
Our shipments are right.
We have a labor saving mill, so—
Our prices are right.

We Specialize in Oak and Mahogany Veneers, sawed and sliced. Also Quartered Oak and Mahogany Lumber

Let us know your wants

Fred W. Black Lumber Co.

2245 So. Crawford Ave., CHICAGO, U.S.A.

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for

Poplar and Red Gum Veneers and Crossbanding

H. C. HOSSAFOUS

MANUFACTURER OF

Sliced Quartered White Oak Veneer

Genuine Indiana and Ohio white oak logs, cut into flitches at our own plant, **perfectly smooth cut and dried flat** and without gloss.

We can help you solve your Sliced Oak Problems
Let us quote you on your Requirements

DAYTON, OHIO

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

MAHOGANY LUMBER—VENEERS—Foreign and Domestic Fancy Woods—Panel Stock

Veneers in all thicknesses from 1/28″ to 1/4″

We make a specialty of 1/20 Mahogany Veneers both sliced cut and sawed. Write us.

HUDDLESTON-MARSH LUMBER CO., 2260 Lumber Street
CHICAGO, ILL.

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

Rotary Cut Veneers

For the Furniture Trade

We produce our own Stock

Being advantageously located in the midst of the great timber section of North Carolina, we are in position to satisfactorily supply the needs of the furniture trade.

"Quality and Service" is our motto.

Write us for prices

Carolina Veneer Company

JOSEPH E. KOCHA, President

BILTMORE, NORTH CAROLINA

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker". They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

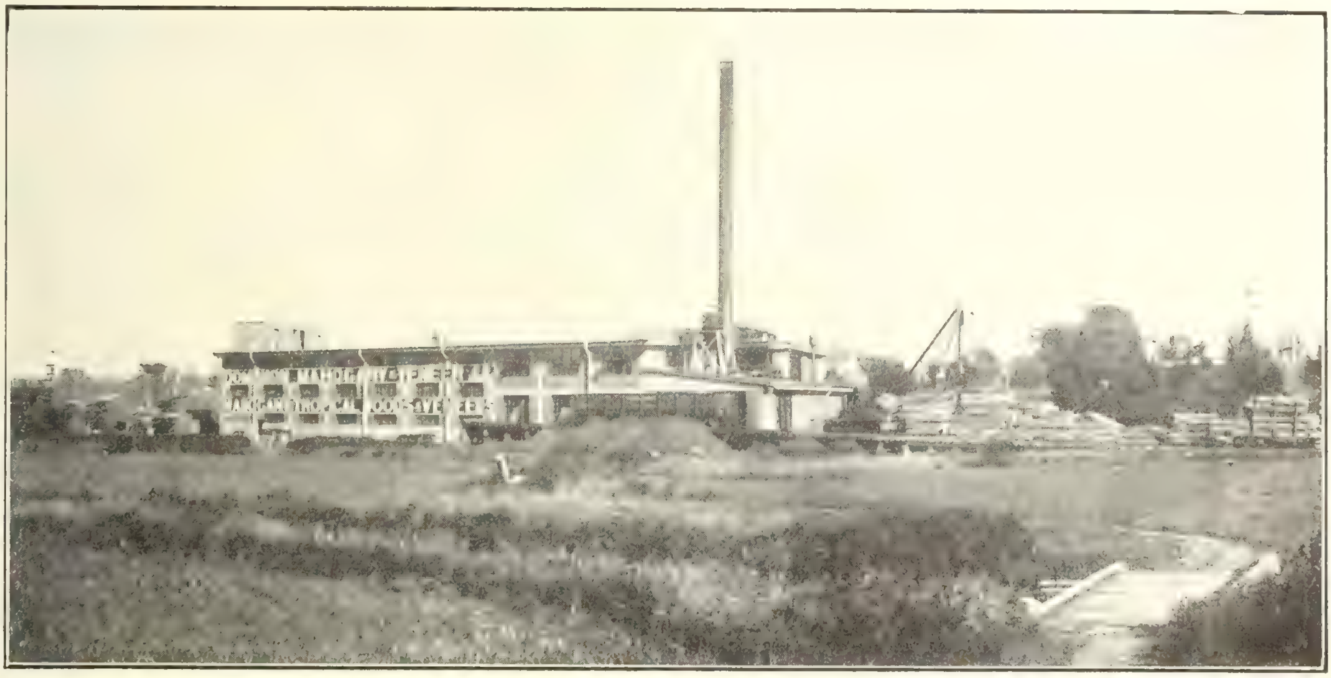
OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

The Dominion Mahogany & Veneer Co.

Limited



The Pioneer Mahogany Mill of Canada

LUMBER— African, Mexican, Cuban Mahogany, English Oak, Teak, Black Bean and Vermillion.

VENEERS—Sawed, African and Mexican and Cuban Mahogany, Maple, English Oak, American Quartered and Plain Oak 1/20"-1/4".

Sliced, African and Mexican Mahogany, Circassian Walnut, Italian Walnut, Birch, etc. 1/24", 1/20", 1/16".

ROTARY CUT— Birch, Maple, Ash, Gum, Poplar 1/24"-1/4".

Drawer Bottoms and Pin Block Veneers and Door Stock.

MADE IN CANADA

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

Dominion Mahogany & Veneer Co., Limited

MONTREAL WEST, QUE.

Buy Direct
From the Manufacturer
We are their Salesmen

The
**Saw Mill Owners
Sales Co.**
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston, New York, Watertown, Montreal, Quebec, Toronto

- Ash
- B.C. Doors
- Birch
- Basswood
- Beech
- Cherry
- Cedar
- Chestnut
- Cottonwood
- Elm
- Fir Finish
- Hickory
- Hemlock
- Maple
- N.C. Pine
- Oak
- Poplar
- Red Gum
- Red Pine
- Sap Gum
- Spruce
- Sycamore
- Shingles
- Tamarac
- Timbers
- Walnut
- White Pine
- Yellow Pine

We Solicit Your Inquiries

News of the Trade

The Upton Sash & Door factory has been registered at St. Ephrem D'Upton, Que.

The Welland Lumber Company, Limited, has been incorporated with a capital of $100,000.

The firm of Legault & Legor, sash and door manufacturers, has been registered in Montreal.

Work has started on a new wood-working factory at Moncton, N.B., owned by Mr. P. N. LeBlanc.

The partnership of Noiseaux & Boy, sash and door manufacturers, of St. Jean Baptiste, Que., has been dissolved.

Mr. J. O. Gilbert, owner of the East Dudswell Sawmill, Que., which was recently burned down, intends rebuilding at an early date.

The Superior Sash & Door Company, Limited, has been incorporated with a capital of $60,000, with head office at Vancouver, B.C.

The Toronto Woodworking Company has been incorporated with a capital of $40,000, under the title of Woodworkers, Limited.

The Gardner Basket Company, Limited, has been incorporated with $45,000 capital for the manufacture of boxes, baskets and other wood products.

Mr. C. T. W. Piper, of Burnaby, is negotiating for a site east of the Haney Wood Company's works, Port Haney, B.C., for the erection of a shingle mill.

Mr. Garnet P. Grant, of Toronto, has retired from the directorate of Carriage Factories, Limited, Montreal, and is succeeded by Mr. W. J. Sheppard, of Waubaushene, Ont.

The D. Morton Company, Limited, has been established with a capital of $20,000, to carry on the business of lumber merchants, sawmill operators, etc., with head office at Victoria, B.C.

Mr. George Watson, of Flesherton, Ont., has purchased the water power at Priceville, and the land which adjoins, with the intention of building a sash and door factory in the near future.

The Northern Veneer Company, Limited, Grimsby, Ont., which was recently incorporated with a capital stock of $200,000, reports that it intends to manufacture veneer for the basket business.

Samples of Douglas fir from British Columbia are to be submitted for experiment to McGill University by the Dominion Government with the object of standardizing this timber for the commercial market.

La Compagnie Industrielle de Vaudreuil, Limitee, has been incorporated with a capital stock of $49,000. The new company will manufacture lumber, doors, sashes, etc., and the chief office is Vaudreuil, Que.

Messrs. Dauphin and Company's Basket factory at Ridgetown, Ont., is busily engaged with the orders that are pouring in. A useful feature of the plant is that the small pieces of timber left over find a ready market.

The Strathroy, Ont., Council is stated to have offered a fixed assessment and free water as inducements to the Canadian Handle Company to rebuild in Strathroy their woodworking factory which was destroyed by fire some time ago.

Mr J. M. Struthers, of Guelph, Ont., after paying a visit to the Furniture Exhibition in Toronto recently, suggests that the show be made a permanent one and held during the two weeks of the Canadian National Exhibition in the fall.

The peg factory of Messrs. J. Lewis and Sons, Lewiston, N.S., was burned down on January 21, involving a loss of $50,000. The planing mills and lumber yard of Messrs. A. Coates and Sons were also destroyed by fire, involving over

For Sale

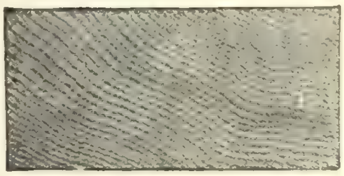
Planing Mill and Retail Lumber Business in City of Stratford, Ont. Solid two-storey brick building and basement. Machinery in good running order. Good reasons for selling. KRUG, VOGT & CO., Stratford, Ont.

7% INVESTMENT 7% **PROFIT SHARING**

Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.

Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO



Every kind and form of

DRYING LUMBER

Grand Rapids Dry Kiln

QUALITY DRYING

Grand Rapids
Mich. - U. S. A.

OVER 65 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.

MUNN & Co. 363 Broadway. **New York**
Branch Office, 62[illegible] Washington, D. C.

Stock Panels

We carry in our shipping room at all times a large assortment of stock panels, mostly 3-ply, ¼ inch thick, in **Plain Oak, Quarter Sawed Oak, Mahogany, Birch and Maple,** both one and two good sides from which we *can ship same day order is received.*

Veneer panel making is our specialty, and we claim that the panels we make are cheaper in the long run for they

Will not come to pieces after they are in the furniture

Do you see the point?

Send us your orders, or ask for Stock List

If we do not have on hand what you want, can build and ship promptly anything in 3 or 5-ply.

The
Gorham Brothers Company
Mt. Pleasant, Mich.

PATENTS

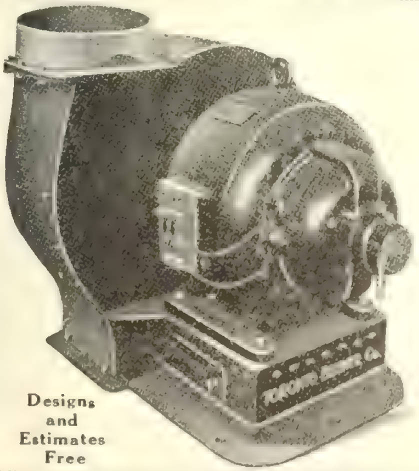
Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

PATENTS

STANLEY LIGHTFOOT
Patent Solicitor and Attorney
Canada $45.00 United States $65.00
Lumsden Building - TORONTO, CAN.



Designs and Estimates Free

REDUCE YOUR FIRE RISK

and Consequent Cost of Insurance

Increase the Efficiency of your Plant by Installing our Slow Speed Low Power

EXHAUST SYSTEMS

which carry off the refuse from machinery and feed combustible material to furnaces for fuel or deposit it into a suitable receptacle.

Improved Automatic Furnace Feeders

Toronto Blower Co., 156 Duke St., Toronto, Ont.

$25,000 loss on January 27. Both the plants will be rebuilt as soon as possible.

The Canadian Wood Preserving Company, Limited, with head office at Winnipeg, has been incorporated with a capital stock of $10,000. One of the promoters is Mr. John A. Smith, of Winnipeg. The company will manufacture lumber, including railroad ties, bridge timbers and piling.

The Maritime Provinces import only 12.3 per cent. of the woods they use, and their imports are practically all of woods that do not grow in the provinces themselves. The manufacturers are proficient in the art of utilizing their native woods to the best advantage.

Mr. R. H. Campbell, director of forestry for the Dominion of Canada, has written to the Board of Trade stating that a study of the wood-using industries of British Columbia will be made in 1915, after the woodworking industries of the prairie provinces and Quebec have been gone into.

With head office at Vancouver a new company called the Ardley Lumber and Shingle Company, Limited, has been incorporated with a $15,000 capital to carry on the business of lumber, lath, shingles, shingle bolts, timber and sash door manufacture, etc., also for the carrying out of construction work.

Mr. A. J. Echardt has disposed of the National Casket Company, and National Silver Plate Company, of which he was the sole owner. To mark his retirement from commercial life, Mr. Eckardt distributed $40,000 between the heads of the departments and the old employees, some of whom have from 20 to 40 years' service with the firm.

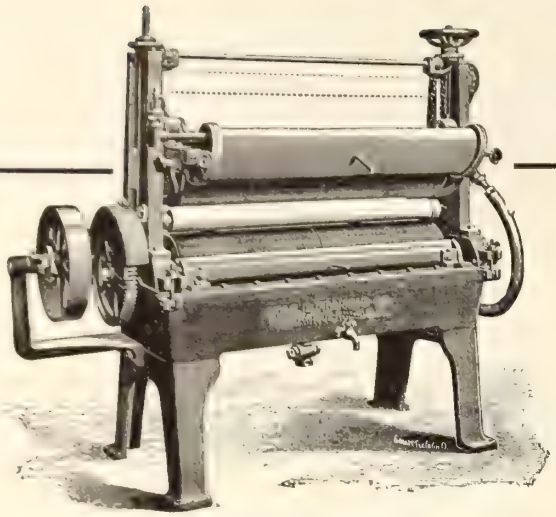
The Lakes Timber Company, Limited, has been incorporated with a capital of $50,000, for the manufacture and sale of wood and timber products, and to acquire timber limits and carry on the business of lumbermen. The directors include Mr. Otto Herman Diercks, lumberman, of Rainy River, Ont., where the head office is situated.

Messrs. A. and Henry B. Hicks, two of Bridgetown's youngest and most energetic business men, who commenced business some twelve years ago, have built up a business as contractors, manufacturers of lumber and furniture importers which is second to none in the province. Their building contracts extend over a wide area, while their furniture wareroom is said to be one of the largest in that part of Canada

Of the many industries of the Maritime Provinces that of Christie Bros. & Company, Limited, Amherst, has made notable progress during 1913. In the casket, trunk and valise departments especially business has been pretty good, and generally speaking the quality of goods manufactured by this firm has won them a high reputation and has done much in assisting them to hold their trade during the year just closed.

The John S. Morlock Furniture Company, of Hanover, Ont., propose erecting an upholstering factory at Stratford. The Charles Diebel Furniture Company, also of Hanover, also contemplate locating a new plant for the manufacture of furniture frames, with dry kiln, and the Stratford Manufacturing Company are thinking of largely increasing their plant. By-laws to provide money grants are to be submitted to the ratepayers without delay.

The British Columbia Government has been asked to send an exhibit of forest resources to the National Forest Products Show at Chicago. In view of the importance of Chicago as a retail lumber centre and the fact that the Underwood tariff law has opened up new markets in the United States for British Columbia lumbermen, it is believed that the invitation will be accepted. Trial shipments of shingles and interior finish have already been sent by several firms in the middle west and it is expected that an effort will be made to push the sale of Douglas fir on the American markets.



A FRIEND IN NEED

You need this friend because it will glue your lumber and veneers in the best and most economical manner—saving you enough in glue, time and labor to quickly repay the low price of the machine—according to the amount of work you have for it. That is why it has a wide acquaintance.

A LIFE-LONG FRIEND

This particular friend does as good work one day as another—is always ready and willing and has the constitution to withstand severe usage and avoid frequent expense and trouble with repairs or mechanical surgery—that's the kind of a friend to have.

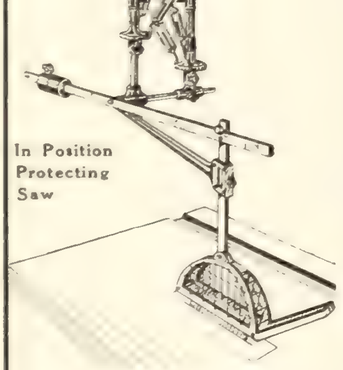
OTHER STYLES

The above is the popular machine. We, however, build a variety of Glue Spreaders for different glues and purposes.

CHAS. E. FRANCIS CO.
SPECIALISTS IN GLUE ROOM EQUIPMENT
Rushville, Ind., U. S. A.

Manufacturers and Jobbers

Safety Appliances



In Position Protecting Saw

AUTOMATIC CIRCULAR SAW GUARD—MODEL "G"

This guard for use over circular saws is entirely automatic and self-adjustable.

Lumber, when going through the saw, will automatically raise the guard, and allow it to drop back into place over the blade when the work is completed. All unnecessary and clumsy arrangements have been eliminated, thereby greatly reducing the mechanic's risks.

It is adapted for up-end work, dado and grooving, for which adjustment can rapidly be made.

It is furnished complete for ceilings up to 10-ft. in height. and for circular saws 18-in. in diameter and under. Price for this guard is $25.00 net, F. O. B. factory. For ceilings above 10-ft. the price for the extra piping, ceiling clamps, turnbuckles, etc., is $6.00 for every 7-ft.

In measuring, kindly give the distance from the ceiling or bottom of girder to the top of the table. Also specify size of largest saw used, maximum thickness of lumber to be cut and the distance the saw extends above the table.

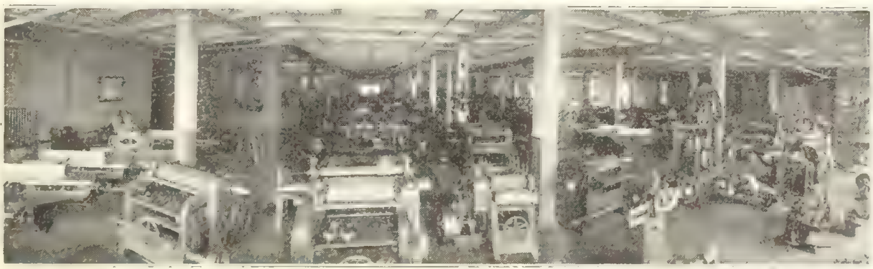
Complete Safety Device Catalogue.

"To Protect Yourself Protect Your Workers" sent on request. Splendid proposition for "live wire" agencies.

BASS BROS., 82 Walker St., NEW YORK

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.



52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

Machine does everything shown.

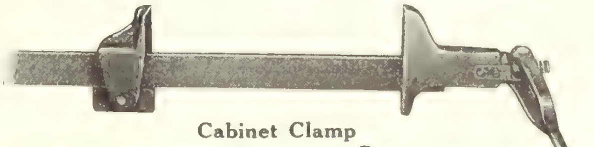
Mr. Planing Mill Man:

It isn't your fault if you haven't one of our *Perfect Window Frame Machines,* for we know what it is, and it's up to us to show you. Won't you help us by writing for descriptive literature? Hundreds of planing mills in all parts of the country, who are using it, now control the frame business in their neighborhood, making nice profits on a small investment.

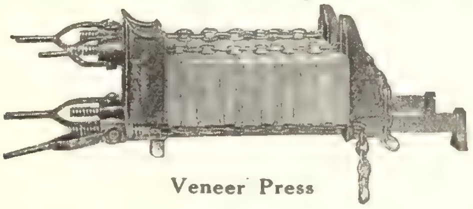
We repeat: Please send for descriptive literature.
It will lead you to bigger profits than it will us,
but we'll make a little too.

Smith & Phillips Mfg. Co.
412-422 N. Sangamon Street, CHICAGO, ILL.

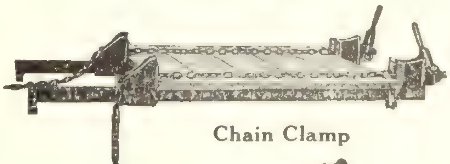
"Pioneer" Moulding Sander
Power Veneer Presses



Cabinet Clamp



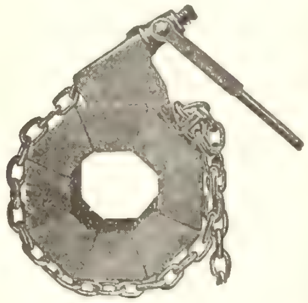
Veneer Press



Chain Clamp

Write for
Catalogue
and Prices

Black Bros.
Machinery Co.
Mendota, Ill.



Column Clamp

LISTEN

We are one of the largest manufacturers of special **Hardware for Store Fixtures and Show Case Manufacturers** in the World. Our latest catalogue fully describes every metal specialty you use in show cases and store fixtures. Send for a copy—It will save you money.

The Reflector & Hardware Specialty Mfg. Co.
Western Ave. and Twenty-Second St. - - - CHICAGO, ILL.

TIMMS, PHILLIPS & CO.
Limited
VANCOUVER, B.C.

Write us for attractive prices on

Clear Douglas Fir
Clear Red Cedar
Clear Spruce

Also X X X Red Cedar Shingles

Canadian
Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to
GENERAL OFFICES— - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS

American
and
Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:
BRASFIELD, ARKANSAS

We offer for immediate shipment
DRY

RED GUM
Quartered

3 cars 4/4, 1's and 2's
2 “ 5/4 “
1 car 6/4 “
1 “ 8/4 “
3 cars 4/4 No. 1 Com.
1 car 5/4 “
1 ‘ 6/4 “
1 “ 8/4 “
1 “ 10/4 “

RED GUM
Plain

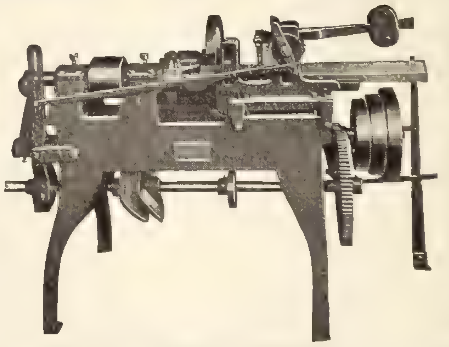
4 cars 4/4, 1's and 2's
2 “ 5/4 “
1 car 6/4 “
1 “ 8/4 “
1 “ 10/4 “
2 cars 4/4 No. 1 Com.
1 car 5/4 “
1 “ 6/4 “
1 “ 8/4 “
1 “ 10/4 “

The Famous Cache River Gum
Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock.

For Long Timbers
Surfaced or Rough
in Douglas Fir
or for
B.C. Red Cedar Shingles
Write or Wire
W. G. Scrim Lumber Co.
Vancouver, B.C.

Makes Wooden Plugs from Scraps



The demand for wooden plugs to jam the ends of big rolls of paper is much greater than the supply. The paper mills can't secure enough of them. This machine automatically makes 20,000 of these plugs in ten hours, from short stock and scraps around the plant. We have full particulars which we will be glad to send you. Testimonials? Yes, lots of them. Better write us to-day.

EAGLE MACHINE WORKS, 332 Market St. Indianapolis, Ind., U. S. A.

WE CARRY THE LARGEST AND
MOST COMPLETE
STOCK OF

**Walnut
Lumber**

IN THE WORLD.

Write us for prices on any grade,
1/4″ to 4″ in thickness.

2,000,000 FEET ALWAYS IN STOCK

EAST ST. LOUIS WALNUT CO.

East St. Louis, Illinois, U.S.A.

**Southern Red
and Sap Gum**

Our Specialty

Plain and Quartered sawn, and sorted for Mahogany or Circassian Finish. We guarantee our Gum to be as straight as any other wood. If you have used gum and had bad luck, let us talk to you about it, and if you have never used gum and desire a fine cabinet wood that will take any finish let us tell you how to get the best results. Also

Fine Figured Quartered White Oak

G. H. Evans Lumber Co.

Hardwoods and Pine

CHATTANOOGA, TENNESSEE, U. S. A.

LUMBER

Good Grades Right Prices Prompt Shipments

WE have a complete stock of Canadian Hardwoods on hand and ship on National Hardwood Association Rules of Inspection. Let us quote on your lumber wants. Here is a list of some items we want to move for piling space.

150 M ft.	4/4	No. 2 & No. 3 Com.	Birch
100 M ft.	4/4	No. 1 Com. & Betr.	“
8 M ft.	5/4	“	“
20 M ft.	6/4	“	“
25 M ft.	8/4	“	“
10 M ft.	10/4	“	“
28 M ft.	16/4	“	“
20 M ft.	8/4	“	Soft Elm
6 M ft.	16/4	“	“
50 M ft.	12/4	“	Rock Maple
10 M ft.	6/4	“	Beech
25 M ft.	4/4	No. 2 Com. & Betr.	Oak

**C. G. Anderson Lumber
Company, Limited**

Manufacturers and strictly Wholesale Dealers

Manning Chambers, Toronto

OHIO
Hardwood Manufacturers and Dealers

Distributing yards:—Baltimore, Md., Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co., CINCINNATI, OHIO.

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES.

THE

GOTSHALL MFG. CO.

TOLEDO, OHIO

Hardwood Manufacturers

We carry dry stock in

Quartered and Plain White and Red Oak,
Ash, Hickory, Cottonwood,
Sycamore, Cherry
Walnut & Poplar

cut from Northern Ohio timber

¶ We solicit enquiries for furniture, bending and wagon stocks, timber and piling. We have two Band Mills.

5/8″ Soft Yellow

POPLAR

Selected to Widths

7 to 11″ wide 18 to 23″ wide
12 to 17″ wide 24 to 28″ wide
29 to 37″ wide

All grades and thicknesses of

Yellow Poplar—Red Gum
White Oak, Ash, — Mahogany
Chestnut — Cherry
Hickory Lumber—Hickory Axles

Charles F. Shiels & Co.

CINCINNATI, O.

OAK and RED GUM

OUR SPECIALTY

At our Tennessee mill we are producing some choice

Plain and Quartered Red and White Oak. Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

Prompt Shipments and High Grades our Hobby. Let us quote you on your requirements.

Mills—TENNESSEE
ARKANSAS

DUHLMEIER BROTHERS

Main Office & Yard,
CINCINNATI, OHIO,
U. S. A.

INDIANA HARDWOODS

Young & Cutsinger

Manufacturers and Wholesale Dealers

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The

Powell-Myers Lumber Co.

South Bend, Ind.

Anything and Everything in

Hardwoods

cut to your order

OUR SPECIALTIES

Oak, Ash, Hickory, and Poplar Dimension

Red and White Oak Car Stock

White Oak Timbers, White Oak Bridge Plank

Oak Reaches, Oak Poles

Chair, Table and Implement Stock

Oak Bending Plank

SEND US YOUR ENQUIRIES

Man to Man

Our business is Hardwood Lumber.

We have a large stock of all grades and kinds.

It is our earnest wish to fill your order with exactly what you want and need.

Our success depends entirely upon how well we satisfy you and this we realize.

Tell us what you want and we'll tell you frankly whether or not we can satisfy you.

Licking River Lumber Co.

SOUTH BEND INDIANA

Long-Knight Lumber Company

Circassian, Veneers, Mahogany

Hardwood Lumber

INDIANAPOLIS - - INDIANA

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
[illegible] Machine Company, Woodstock, Ont.

BABBIT METALS
[illegible] Metal Company, Toronto.
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co.; P., New York City.
Sinker-Davis Co., Indianapolis, Ind.

BAND SAWS
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.
Federal Engineering Co., Toronto.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Porter Machinery Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R.. Toronto.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.

DOVETAILING MACHINES
Advance Machinery Co., Toledo, Ohio.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.

EDGERS (Gang)
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Advance Paint Co., Indianapolis, Ind.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Advance Machinery Company.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.

GLUE SPREADERS
Advance Machinery Co., Toledo, Ohio.
Chicago Machinery Exchange, Chicago, Ill
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Porter Mach. Co., C. O., Grand Rapids, Mich.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Anderson & Co., C. G., Toronto, Ont.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Licking River Lumber Co., South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Sawmill Owners Sales Co., Montreal, Que.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Young & Cutsinger, Evansville, Ind.
Thompson & Co., Lewis, Philadelphia.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer & Boschert Co., Montreal.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Anderson Lumber Co., C. G., Toronto, Ont.
Burkholder Lumber Co., S., Crawfordville, Ind.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.
Young & Cutsinger, Evansville, Ind.

MACHINE KNIVES
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Advance Paint Company, Indianapolis, Ind.
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Black Bros. Machinery Co., Mendota, Ill
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Sidney Tool Co., Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer & Boschert Press Company, Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

RESAWS
Canada Machinery Corporation, Galt, Ont
Chicago Machinery Exchange, Chicago, Ill
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Preston Woodworking Mach. Co., Preston, Ont.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS
Porter Mach. Co., C. O., Grand Rapids, Mich.

SANDERS
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Williams Machinery Co., A. R., Toronto, Ont.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Bass Bros., New York.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Canada Machinery Corporation, Galt, Ont
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

SAW JOINTERS
Diehl Machine Works, G. M., Wabash, Ind

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill
Whitney & Sons, Baxter D., Winchendon, Mass

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill
Diehl Machine Works, G. M., Wabash, Ind.
Williams Machinery Co., A. R., Toronto, Ont

SHAPERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q
Smith & Phillips Mfg. Co., Chicago, Ill
Whitney & Son, Baxter D., Winchendon, Mass

SHELLAC
Advance Paint Co., Indianapolis, Ind
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., [illegible]
Ormsby Company, A. B., Toronto, Ont
Sheldons Limited, Galt, Ont
United States Steel Tank & Pipe Company, Chicago, Ill

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

STAINS
Advance Paint Company, Indianapolis, Ind.
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Porter Mach. Co., C. O., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Hutchison, M., Toronto, Ont.
Sidney Tool Company, Sidney, Ohio.

VARNISHES
Advance Paint Co., Indianapolis, Ind.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Strong Veneer Company, Jamestown, N.Y.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Veneer Manufacturers Co., Chicago, Ill.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WALNUT LUMBER
East St. Louis Walnut Co., East St. Louis, Ill.

WINDOW FRAME MACHINERY
Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES
Advance Paint Co., Indianapolis.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE
Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher and the Ambitious Student.

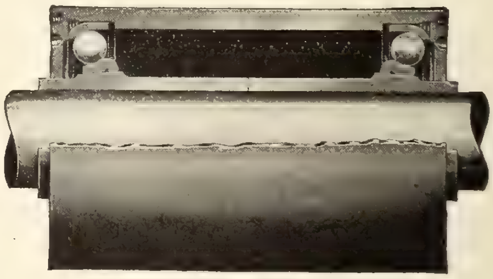
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

HOLDS THE WORLD

ATLAS
BRAND
VEGETABLE
GLUE
SETS—STICKS—STAYS

HOLDS THE WORLD

From A Customer

"It is unusual to improve the quality and lower the cost at the same time—and yet this is what Atlas has done for us."

You Are Going to Use Atlas Glue Eventually

Our research department will continue to keep us as far ahead of the " just as good's" as we are right now; and the sooner you write us about your work and learn what we can do for you, the better off you will be.

Quality First—Then Economy—Atlas Gives You Both.

National Process Company
Manufacturers
Indianapolis, Indiana, U. S. A.

The Standard
Channel Steel, Roller-Bearing
Dry Kiln Trucks

have always had so high a reputation for QUALITY that some truck users may have gained the impression that they are also high in PRICE.

That isn't so! The Standard Dry Kiln Trucks—the most durable, easiest-running, longest-lived trucks on the market—will cost you NO MORE than trucks of inferior quality.

The Standard Trucks are made in every style required for dry kiln purposes. Write for price and printed matter. Address: The Standard Dry Kiln Co., 1560 McCarty St., Indianapolis, Ind.

The Standard Dry Kiln Co.

PERKINS
VEGETABLE GLUE

Is better than any glue made for built-up-stock and veneer laying.

It is applied without heat and does away with heat in the glue room.

It is being used by many of the largest manufacturers of high-class furniture in this country.

We can save you 20% of your present glue bills and give you better work besides.

If you are interested or doubt anything we have said, drop us a line. We will send you full particulars and give you the names of some of our customers—in the same line as you who will be glad to give you their frank opinion.

Go into this matter right now, while you think of it.

It's worth investigating

Perkins Glue Co.
809 J.M.S. BLDG.
SOUTH BEND
INDIANA

Last, – most important – the finish

MARIETTA WOOD FINISH SPECIALISTS

If your product is made to sell, your greatest opportunity to put selling force into it lies in buying and applying the correct finishes.

SPARTAN ART WOOD STAINS

combine superlative beauty and quality with the advantage of being thoroughly practical.

Ask us about our new non-fading mahogany stain.

Marietta Paint & Color Co.
Marietta
Ohio

Volume Fourteen TORONTO, MARCH, 1914 Number Three

Canadian Woodworker

Follow any Pattern

Whether you do medium, light or heavy-edge shaping, there is a shaping machine that is just right for your work.

Whitney Two-Spindle Shapers

do edge shaping in one cut and to a clean finish,—a finish that could not be improved.

Edge shaping and the many other adaptations of a moulding machine furnish many a chance for profitable manufacture, provided the machine is made with that dependable mechanical fidelity that insures precise cutting at high continuous speed without vibration and heating-up.

Whitney Shapers mean multiplied dividends in Service.

Their utility is so wide and their construction so splendidly practical that we should like to discuss them with you in detail. Say on a post-card "Wanted information about shapers," and you'll get it. It's just as well to get the facts right away whether you intend to buy a shaper now or later.

Baxter D. Whitney & Son, Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives; Henry Kelly & Co
26 Pall Mall, Manchester, England

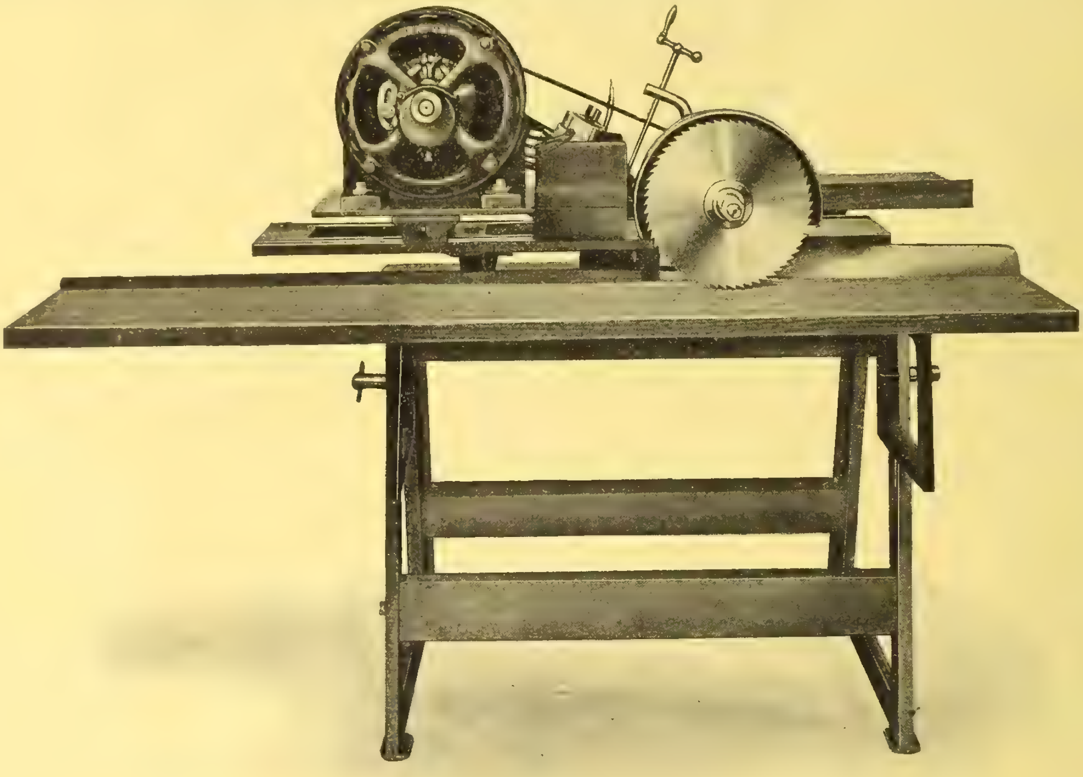
Alphabetical List of Advertisers, page 10

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders, Cabine Makers, Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

Here are a few people who are using our machines :—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.

Perkins Vegetable Glue The Product That Sticks

Let Us Be Your Efficiency Engineer

We wish to impress upon manufacturers of veneered panels and built up work the fact that every pound of material that enters into the composition of Perkins Vegetable Glue is personally inspected and that the finished product is ***absolutely uniform in quality.***

For this reason it is not necessary for our customers to maintain expensive laboratories such as many of the larger users of animal glue have installed to insure the quality of their adhesives. ***We do the glue testing for our customers and sell on quality.***

Originators and Patentees of Perkins Vegetable Glue

Covering a number of years, all classes of stock and the total numbers of factories where we have installed our glue, the very high percent of the business we now hold, proves that our glue and methods satisfy our customers.

This glue is ***applied cold*** and no heated glue room nor heated cauls are required in its use. There is no disagreeable odor to Perkins Vegetable Glue.

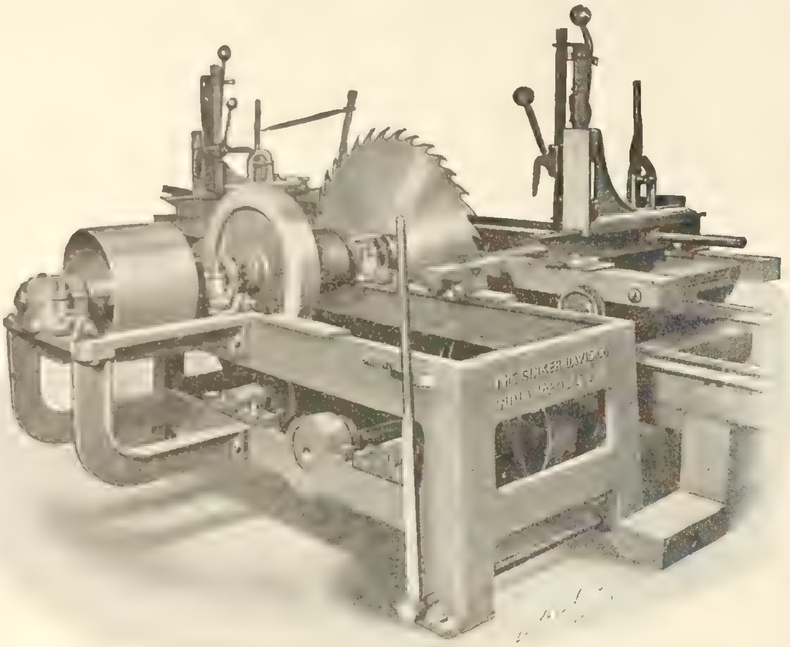
Let us tell you about it. Invite us to call and demonstrate. Write for testimonials from some of the leading built-up stock factories in America.

Perkins Glue Company

809 J. M. S. Building **South Bend, Indiana**

The "HOOSIER" Short Log Sawing Machine

As well built as our largest mill and does as good work.



The Hoosier Short Log Sawing Machine main frame is cast in one piece, which makes it very rigid and this main frame carries the mandrel and the feed works in self oiling adjustable boxes.

On account of the frame being rigid operator can use a very thin saw. The machine is practically self contained and portable and when shipped from the factory includes the track ways and track. We build blocks and carriages to fit all requirements for handling small logs and veneer cores.

For sawing veneer cores we make our improved and grip dogs that dog the cores in the ends and hold them rigid.

For sawing logs whether straight, swell butt or crooked we make a carriage with blocks opening 24-30 and 36-in. with independent knees and Knight's pony single or duplex dogs.

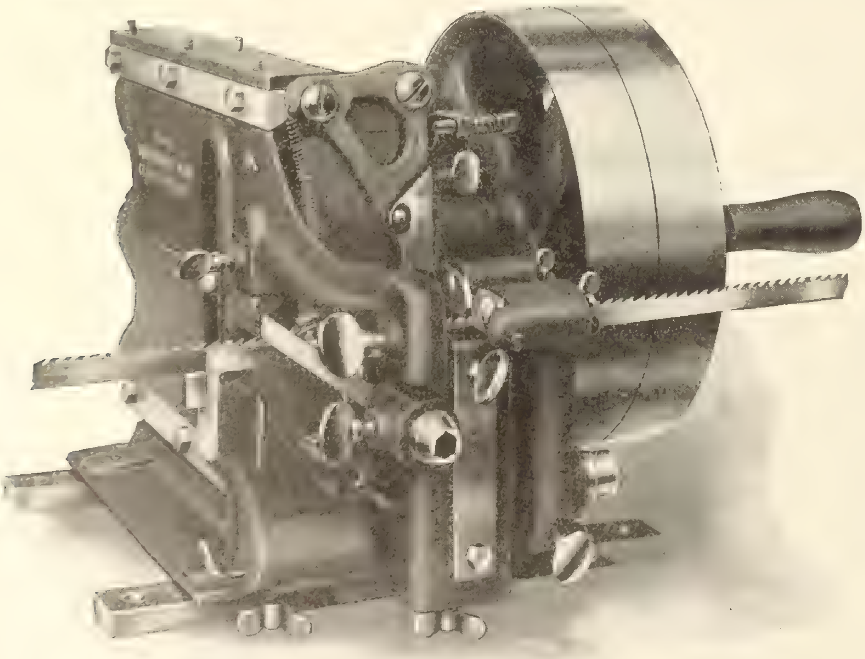
Machine will carry as large as a 54-in. saw and the machine will take care of logs up to 24-in. in diameter.

Write for further particulars regarding this machine and also regarding our New Hoosier Band Saw Mill and our new combination power and hand feed rip saw.

THE SINKER DAVIS CO. - - Indianapolis, Indiana

Manufacturers of the New "Hoosier" Band Saw Mill and All Steel Nigger Proof Head Blocks.

The Man Who Sharpens Band Saws



Combination Band Saw, Filing, Setting and Jointing Machine

For saws ½ to 2 inches wide and 2 to 14 teeth to the inch. Price complete for either hand or power, $55.00. Without setting attachment $35.00. Mention number of teeth to the inch on your saw in ordering.

Can save nine tenths of his time. This machine once started is fully automatic and needs no further attention.

Files — Sets — Joints

in one operation

It files every tooth exactly alike, giving a cutting edge without a particle of burr. It sets the tooth as much or as little as necessary, always leaving the right clearance back of the cutting edge.

It not only saves time in sharpening, but gives you faster, smoother cutting saws which work with less breakage.

The machine will last for years. All wearing parts are steel, and the filing arm works between adjustable steel slides — no babbitting — so that it always runs true.

Send for catalog and list of large users.

The
Wardwell Mfg. Co.
112 Hamilton Ave., Cleveland, Ohio

Morton Dry Kiln Instruments

Fig. 1 Shows Our
Trientroid Scalometer
Price $16.00

It is used for testing lumber to tell when it is dry enough to remove from the kiln.

It is absolutely accurate and will give you just the information you have been wanting. Very simple to use.

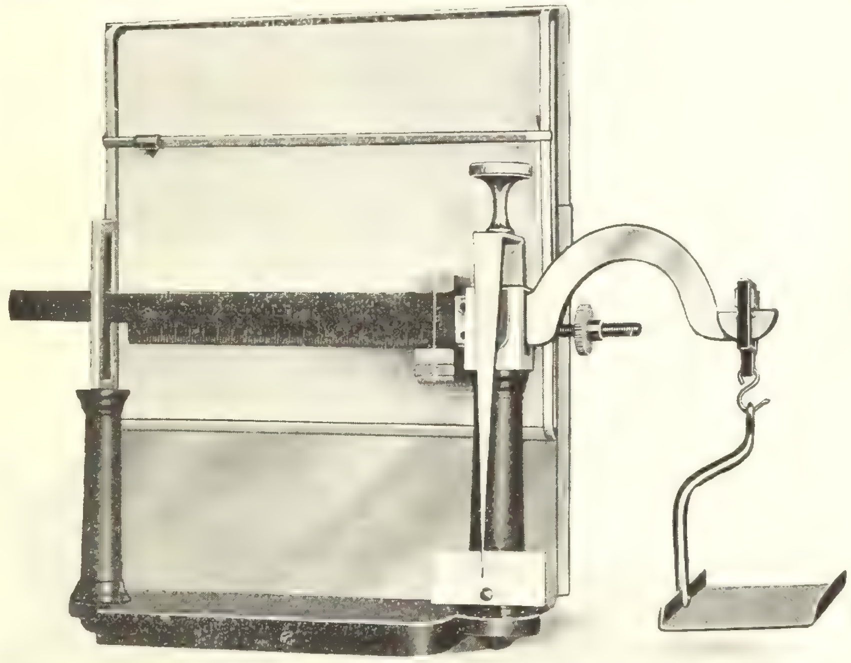


Fig. 1

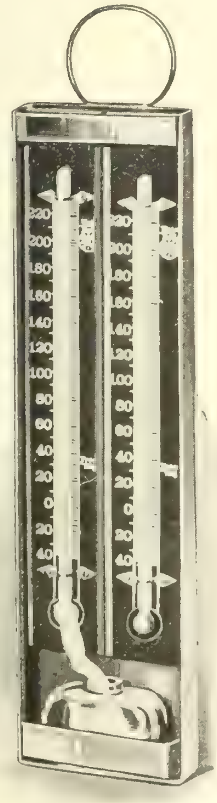


Fig. 2

Registering Hygrometer
Price $6.75

For determining the amount of humidity in the air inside of a dry kiln.

Special Price of
$52.00
F.O.B. CHICAGO

Will be made on these 3 Instruments if ordered together.

Write for our 2 Dry Kiln Catalogs Describing fully Fire Proof Kilns of the Progressive Type, Compartment Type, Pocket Type, Box Type.

A Few Users of these Instruments

Victoriaville Furniture Co., Victoriaville, Que.
Thomas Organ & Piano Co., Woodstock, Ont.
Meaford Furniture Co., Meaford, Ont.
Gerhard Heintzman Co., Toronto, Ont.
Canada Furniture Manufacturers, Woodstock, Ont.
Georgian Bay Shooks Mills, Midland, Ont.
Wm. Rutherford & Sons, Montreal, Que.
Gold Medal Furniture Co., Toronto Ont.
Northern Planing Mills, North Bay, Ont.
George McLagan Furniture Co., Stratford, Ont.

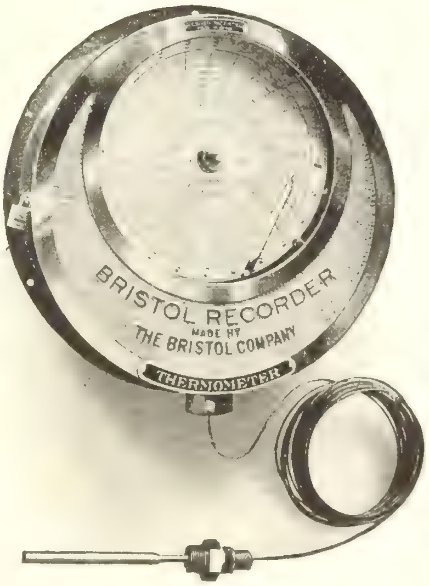


Fig. 3

Long Distance Recording Thermometer
Price $32.00

For keeping an accurate record of the temperature inside the dry kiln each hour of every day.

MORTON DRY KILN CO.

20 W. JACKSON BOULEVARD - - CHICAGO, ILLINOIS

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

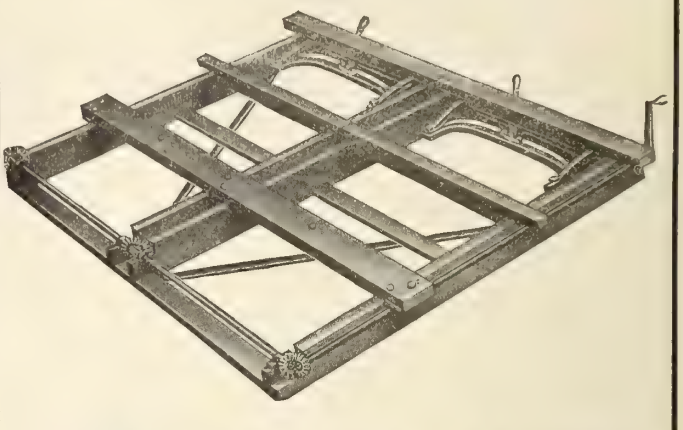
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

Dependable Factory Furnishings

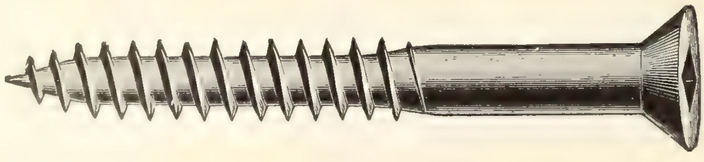
Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.

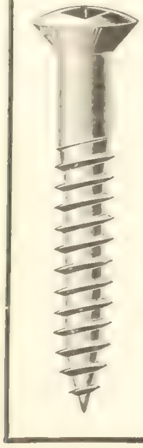
ROBERTSON SOCKET HEAD

Wood Screws



See That Square Hole

Pat. Feb. 2, 1909

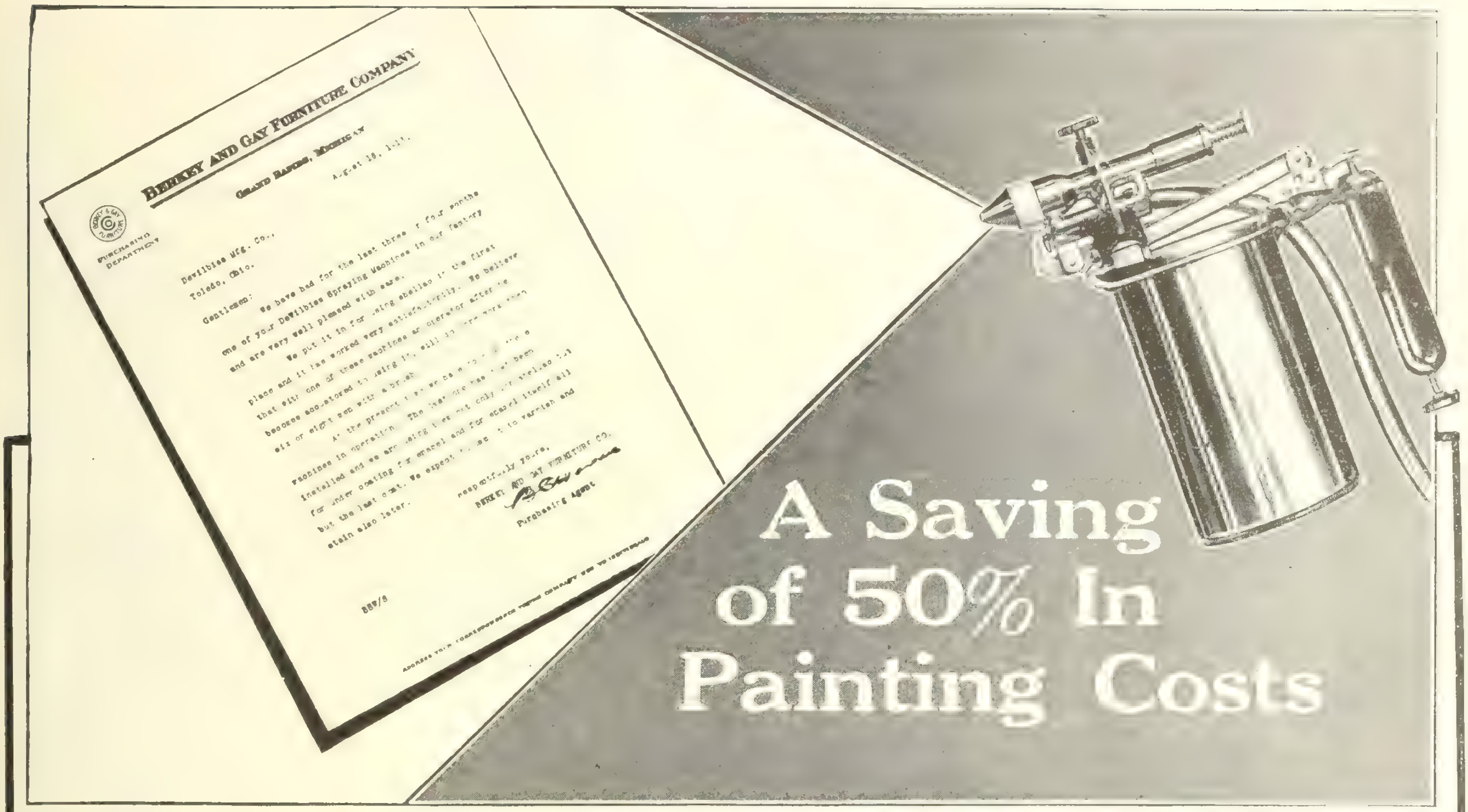


THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO



BERKEY AND GAY FURNITURE COMPANY
GRAND RAPIDS, MICHIGAN

PURCHASING DEPARTMENT

DeVilbiss Mfg. Co.,
Toledo, Ohio.

Gentlemen:

We have had for the last three [illegible] four months one of your DeVilbiss Spraying Machines in our factory and are very well pleased with same.

We put it in for using shellac in the first place and it has worked very satisfactorily. We believe that with one of these machines an operator after he becomes accustomed to using it, will do more work than six or eight men with a brush.

At the present time we have [illegible] machines in operation. The last one has [illegible] been installed and we are using them not only for shellac but for under coating for enamel and for enamel itself all but the last coat. We expect [illegible] to varnish and stain also later.

Respectfully yours,
BERKEY AND GAY FURNITURE CO.
Purchasing Agent

Do you realize what this means—that by merely substituting one process for another, *one* man is enabled to do work that formerly required three or four men?

That's how it was done in the plant of Berkey and Gay Furniture Company. No wonder they're enthusiastic over the results. Read the letter from their purchasing agent—doesn't its optimism explain their enthusiasm: the *repeat orders?* They're only sorry they didn't find out sooner about the savings created by

Aeron -De Vilbiss- Aeron

Paints With Air Paints With Air

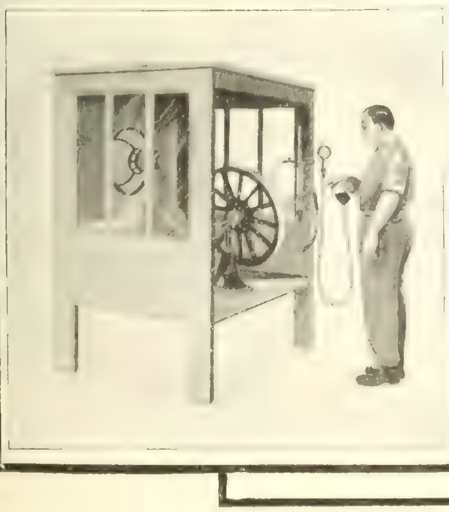
This simple method can be used on practically all coats. The finish is smoother—more uniform—more easily rubbed or sanded and better lasting. An irregular surface is as easily and quickly finished as a smooth one.

Anyone Can Operate Them

The natural position of the hand holding the Aeron places the air trigger directly under the thumb. A downward pressure releases the spray. Its response to the operator's will is practically automatic—flowing fine or coarse—in a steady thick stream or faint vapor as the case may be.

Used Everywhere

Furniture factories—hardware manufacturers—automobile companies—speedometer concerns—typewriter, electrical, radiator and metal working companies of all kinds have found the De Vilbiss Aeron method of painting absolutely essential to an efficient, speedy production. In addition—there's not one of its hundreds of users who have failed to note the savings in time, labor and space that it creates.



Our Trial Offer

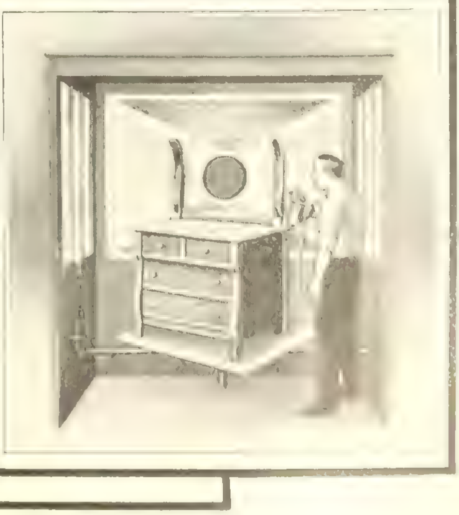
is that you try out this most efficient method of finishing in your own plant for thirty days—see exactly *why* and *how* it will cut your costs, and then if you don't want it send it back at *our expense.*

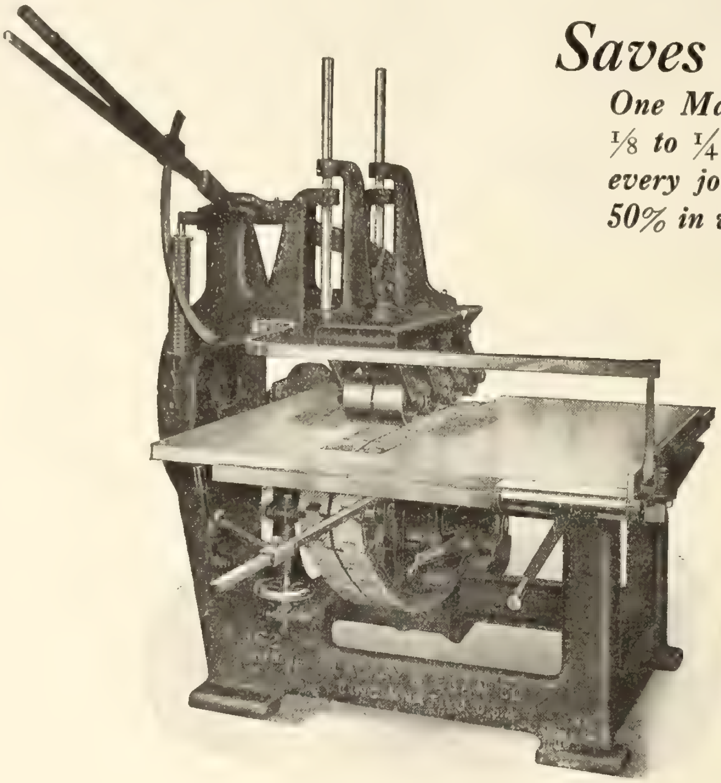
You need this saving now—send for full information today.

The De Vilbiss Mfg. Co.

Toledo, Ohio

1318 Dorr St.





Saves

One Machine operation 1/8 to 1/4" of lumber on every joint and 33 1/3 to 50% in wages.

FAY - EGAN "LIGHTNING" No. 362

Straight EdgeRipping and Jointing Machine

with saw cutting from below

This new machine in one operation rips to width, makes a perfectly straight edge and joints a board so that core stock for veneer panels, tops, kitchen cabinets, tables, caskets, chests, piano cases, etc., can be glued up right from the saw, eliminating the extra handling and glue jointer operation and saving the 1/8-in. to 1/4-in. of lumber usually taken off by the jointer. Saw cuts from below, keeping work clean and does not throw dust and slivers in operator's face. Can be operated by any ordinary machine hand.

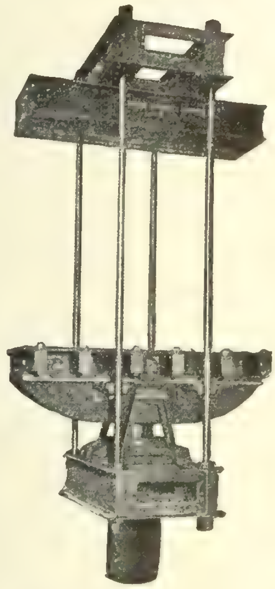
Uses up your short low grade stock. Greatest time, labor and lumber saver produced in years. Everybody will soon be using it—don't wait—be a leader.

Write for Bulletin P-25

J. A. Fay & Egan Company

153-173 West Front Street - Cincinnati, Ohio.

Hydraulic Veneer Press



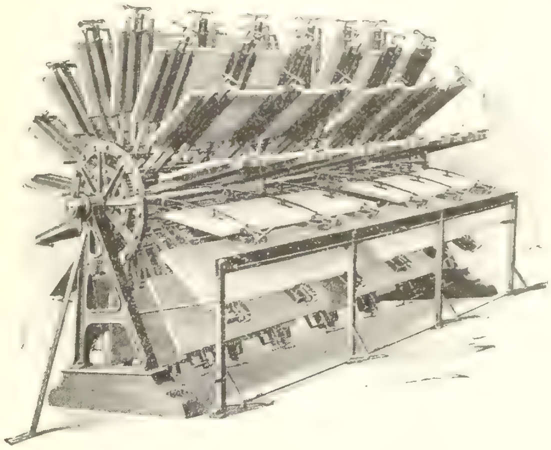
We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

The PALMER
Perpetual Revolving Clamp

"Built to Last"



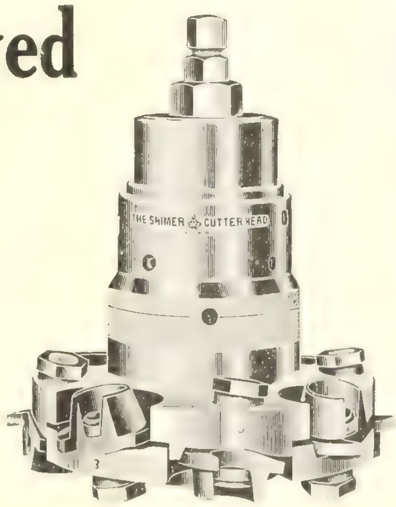
This machine is in successful operation all over America It helps you with rush orders and cuts down your gluing expense. Built carefully of the best materials.

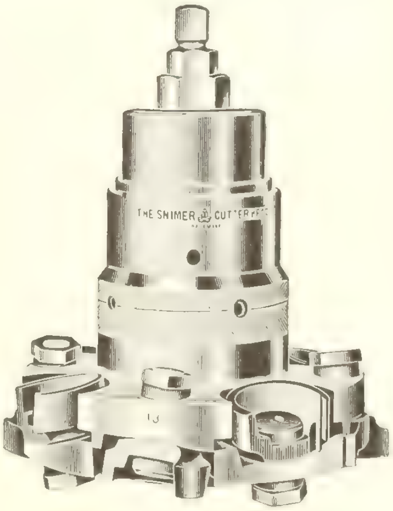
We also make a full line of gluing clamps.

Send for our Catalog

A. E. PALMER & SONS
OWOSSO, MICH.

Every Hour Saved
By the Use of The Shimer Limited Cutter Heads





Adds to the capacity of your mill. These Heads are built especially for the High Speed Matcher and will tongue and groove flooring at 150 to 170 lineal feet or more per minute.

They are self-centered on the spindles by means of a chucking device which grips firmly thereto when drawn up, insuring all the cutters doing their share of the work and removing the objectional set screw which has hitherto been used for fastening purposes.

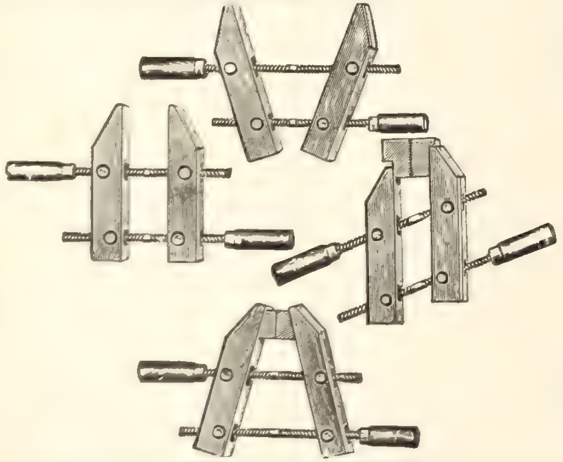
The Bits carry a larger areal surface and the Bit chambers are of greater depth to compensate for the new acute angle given to the Bits for greater relief to the parts coming into contact with the lumber.

Price, net, in solid section, complete for making flooring $67.00. With Expansion feature like illustrations, $72.46, complete.

SAMUEL J. SHIMER & SONS, - GALT, ONT., CAN.

Alphabetical List to Advertisers

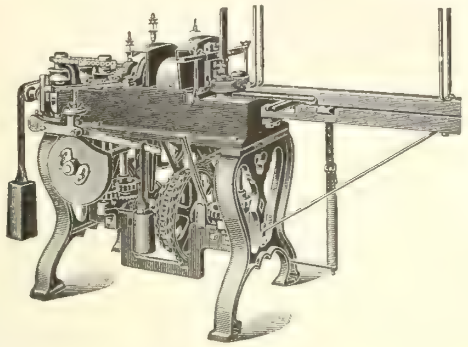
Acme Veneer & Lumber Company	51
Adjustable Clamp Company	10
Anderson Lumber Company, C. G.	64
Andrews Company, A. H.	11
Atlantic Lumber Company	61
Ault & Viborg Company	45
Bass Bros.	58
Billstrom, Nels. J.	12
Black Bros. Machinery Company	59
Black Lumber Company, Fred W.	53
Buss Machine Works	71
Canada Machinery Corporation	16
Canadian Linderman Company	13
Canadian Morehead Manufacturing Company	
Carborundum Company	15
Central Veneer Company	53
Central Veneer Company	54
Chapman Double Ball Bearing Company	70
Chicago Machinery Exchange Inc.	59
Cincinnati Veneer Company	54
Clark Veneer Company, Walter	52
Curtis Machine Company	12
Cyclone Blow Pipe Company	14
Dennison, Herbert, J. S.	57
Denny, Hilborn & Rosenbach	44
De Vilbiss Manufacturing Company	7
Diehl Machine Works, G. M.	14
Dominion Mahogany & Veneer Company	55
Duhlmeier Brothers	67
Eagle Machine Works	61
Elliot Woodworker, Limited	2
Evans Lumber Company, G. H.	64
Fay & Egan Company, J. A.	8
Fox Machine Company	63
Francis Company, Chas. E.	58
Gorham Brothers Company	57
Goshen Veneer Company	53
Gotshall Manufacturing Company	62
Grand Rapids Hand Screw Company	6
Grand Rapids Veneer Works	15
Haughton Veneer Company	49
Hoffman Bros. Company	49
Hossafous, H. E.	53
Huddleston-Marsh Company	52
Huther Bros.	12
Jamieson & Company, R. C.	45
Keiths Limited	
Kosse, Shoe & Schleyer Company	66
Licking River Lumber Company	65
Lightfoot, Stanley	57
Long-Knight Lumber Company	65
Marrietta Paint & Color Company	72
Meakins & Sons	44
Morton Dry Kiln Company	5
Nash, J. M.	11
National Process Company	67
National Securities Corporation	57
National Veneer & Lumber Company	52
Ober Manufacturing Company	11
Ohio Veneer Company	49
Ormsby Company, A. B.	
Palmer & Sons, A. E.	9
Penrod Walnut & Veneer Company	54
Perkins Glue Company	3
Perrin & Company	9
Powell-Myers Lumber Company	65
Pryibil Machine Company, P.	63
Reflector & Hardware Specialty Mfg. Company	59
Robertson Manufacturing Company, P. L.	6
Saw Mill Owners Sales Company	62
Schmidt Company	45
Scientific American	57
Scrim Lumber Company, W. G.	61
Sheldons Limited	14
Shiels & Company, Chas. F.	66
Shimer & Sons, Samuel J.	9
Sidney Tool Company	15
Simonds Canada Saw Company	
Sinker Davis Company	4
Smith & Phillips Manufacturing Company	59
Smith Veneer Machinery Company	11
Spencer, C. A.	60
Standard Dry Kiln Company	67
Stevens & Jarvis Lumber Company	61
Stewart Greer Lumber Company	64
Strong Veneer Company	6
Thompson & Company, Lewis	52
Thompson Veneer Company, W T.	52
Thompson Hardwood Lumber Company	67
Timms, Phillips & Company	61
Toronto Blower Company	57
U. S. Steel Tank & Pipe Company	14
Walters & Sons, H.	63
Wardell Manufacturing Company	4
Whitney & Son, Baxter D.	1
Wood & Son, Fred	15
Young & Cutsinger	65



It Should Be Interesting

To know that the JORGENSEN HAND SCREW has proved itself to be so durable that we replace without charge any broken part. This guarantee costs us little, and yet we sell 4,000 dozens a year. Just think of this the next time you figure on the wooden spindle kind that you know you will SOON PAY TO REPLACE if you buy it. The JORGENSEN is in every way a superior tool—but little difference in the first cost.

Adjustable Clamp Company
215 N. Jefferson St., Chicago, Ill.



Constant Use is Practical Test

Read what one Handle Manufacturer says of our

NO. 10 LATHE

"It gives us great pleasure to state that we have had in our handle factory **for years in constant use**, one of your No. 10 **Automatic Lathes**, and it has been operated by different operators and we consider it one of the best machine we ever had in use.

It is the easiest kept up and turns very **nice smooth handles**. Have used all other manufacturers machines that are in use, I guess, and we consider this the favorite of all of them. If we were going to buy another machine it would be an Ober."

.... **HANDLE CO.**

Name furnished on application.

We make Lathes for turning Fork, Hoe, Rake, Broom, Axe, Pick, Sledge, Hammer and Hatchet Handles and other turned work. Sanders, Bolting Saws, Rip Saws, etc.

Write for free catalogue No. 31

THE OBER MFG. CO., Chagrin Falls, O., U. S. A.

Mr. Veneer Manufacturer and User—

Do you know what the

Smith Veneer Dryer

can do for you? We are installing dryers which meet every need and reduces your drying cost to the minimum. Ask any of our users. Anderson-Tully Co., Memphis, Tenn., are drying 7-32 gum in 50 minutes, bone dry ready for gluing and free from checks and splits or any discoloration. They have two Smith Dryers and are operating them from 60 h.p. boiler capacity. It costs you nothing to know all about the Smith Roller Veneer Dryer—entirely iron—will wear a lifetime—little up-keep expense—entirely successful.

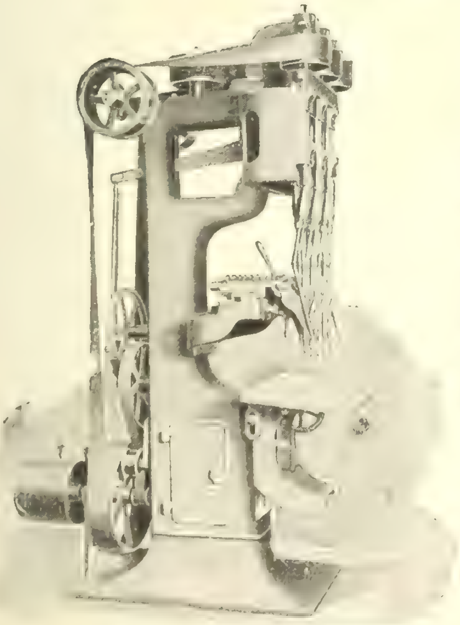
Smith Veneer Machinery Company, Inc.

WATKINS, N.Y.

How About Your

Multiple Boring?

Like to Cut the Cost?



Of course you do. Maybe I can help you. One of my Three Multiple Spindle Boring Machines may be just what you need.

Tell me your troubles.

J. M. NASH, Milwaukee, Wis.

842-848 30th Street

Progressive or Charge Type

Condensing Lumber Driers

Designed and Constructed by

The A. H. Andrews Co.

Wabash Ave. and Morse St., Chicago

Are Selected by Those Who Know

BECAUSE:

Their *Temperature Regulation* is perfect and convenient.

Their *Humidity Control* is practical and easy to accomplish.

Their *Circulation* is positive in action and large in volume.

Their *Drying Time* is reduced to practical minimum, owing to constant and correct conditions of Temperature, Humidity and Circulation.

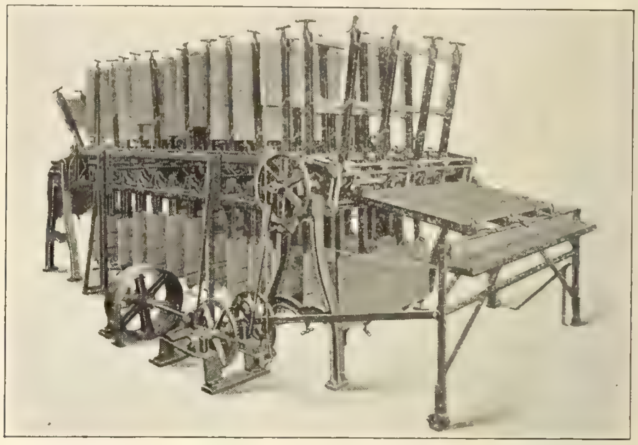
Their *Results* are ahead of all other Dry Kilns.

HUTHER BROS.
Patent Dado Head

Can be used on any circular saw mandrel, and will cut perfect grooves, with or across grain. If not satisfactory, return at our expence—Simple adjustment—no screws. Write for our latest illustrated catalog.

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

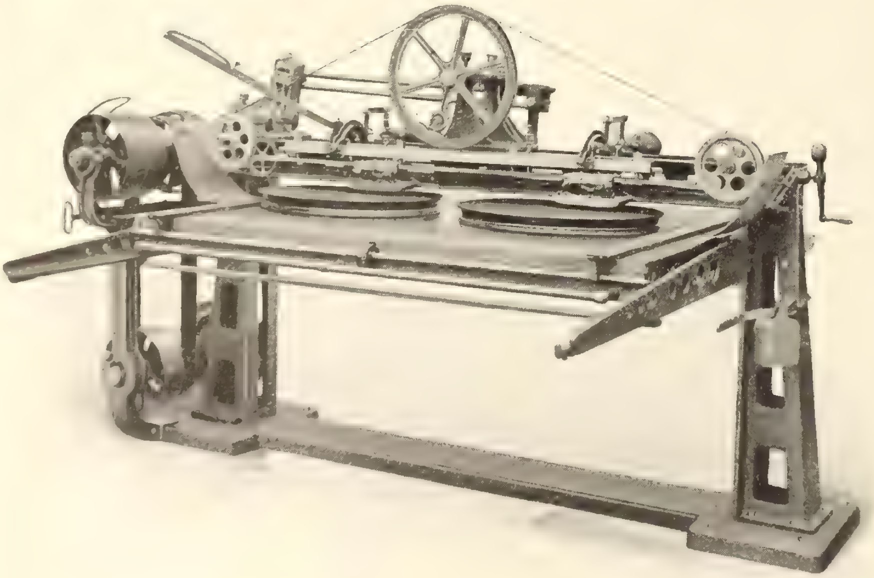
Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

Moore Universal Rubbing Machine



The labor saving advantages of this machine are apparent in the accompaning illustration.

The action of a flexible guiding bar ensures a uniform finish throughout. Any required amount of pressure is obtained by an automatic device on the machine.

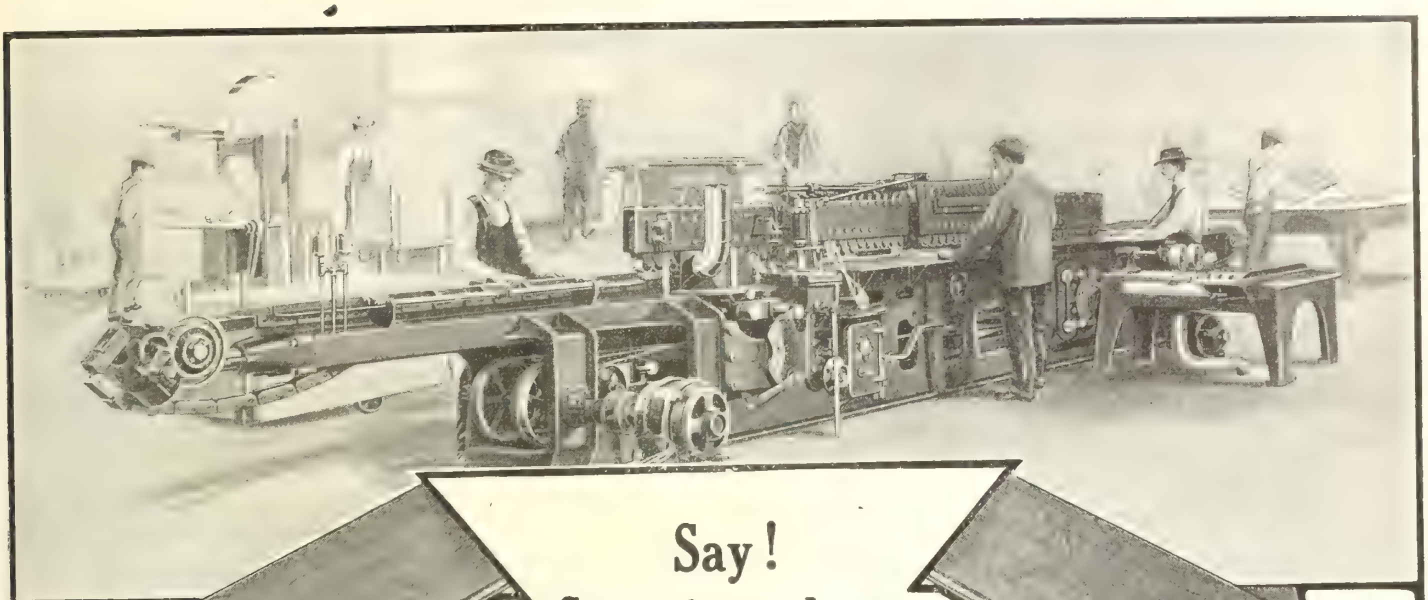
The accomodation of this machine is for cases up to 39 inches high or stock 6 feet by 8 feet.

The floor space required is 10 ft. x 10 ft. for the 8 foot machine and 10 ft. x 12 ft. for 10 foot machine.

We are Successors to Lucas Machine Co., Jamestown, N. Y., Moore Carving Machine Co., Minneapolis, Minn., and Jansen-Peterson Co., Cleveland, Ohio, and will continue to manufacture the complete lines of all three concerns in our new plant at Jamestown, N. Y.

May we send you literature?

CURTIS MACHINE CORPORATION, Jamestown, N. Y.



Say!
Superintendent
Have you ever figured the saving a
Linderman Dovetailer
would effect for us?

Let us Figure for a Few Minutes:—

We cut annually about .... M. feet of 4 in. common strips, average price per M. $........, which totals ... ...

8 in. and 10 in. shiplap brings $.......... per M. If aall 4 in. strips were worked into 8 in. and 10 in. shiplap we would receive ... ...$

GROSS PROFIT ... ...$

COST OF JOINTING ON A LINDERMAN DOVETAILER 75c per M.; cost of matching and handling 50c per M.
M. feet at $1.25 per M. ... ...$

NET PROFIT ... ...$

BESIDES, we cut .... M. feet of 4 in., 6 in. and 8 in. No. 3 Grade lumber for which we receive $........, but for our 10 in., 12 in., 14 in. and 16 in. No. 3 Grades we average $..... per M. If all were made wide we would receive $ ......; cost of joining and handling $1.00 per M. $......

NET INCREASED PROFIT ... ...$

BESIDES, if we had a LINDERMAN we could cut 2 in., 2½ in., 3 in. and 3½ in. strips instead of leaving them in the slab. We should get about ...... M. feet. In the slab they are worth aabout $........ In lumber they are worth about $......... It will cost about $1.25 to join and handle $........

NET PROFIT ABOUT ... ...$

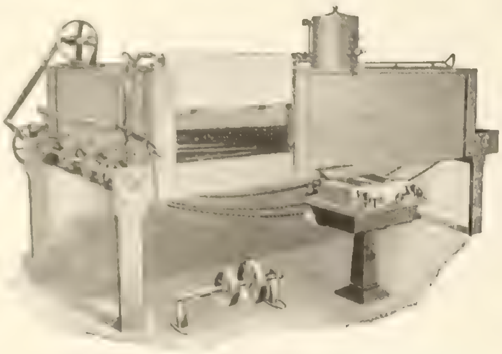
BESIDES, we could work all our shorts into full 16 ft. lengths; make grain doors and save 10 per cent. of edging waste, work in our short shorts, besides use it for other purposes.

WHAT SAY YOU SUPERINTENDENT?

SHALL WE WRITE THE LINDERMAN PEOPLE and investigate? It looks as though we are losing money. Let us send this information to the

CANADIAN LINDERMAN CO., LIMITED

MUSKEGON, MICH. —Works at— WOODSTOCK, ONT.



Automatic Stock Heater and Conveyor

Your Glue Room

We are specialists for the Glue Room. We manufacture everything needed to make it complete. Our equipment is designed to give **Speed—Endurance—Economy**—and includes Glue Jointers, Stock Heaters, Patent Glue and Water Scales, improved Glue Heaters, Glue Spreaders and Glue Clamps, besides a complete line of Cutter Heads.

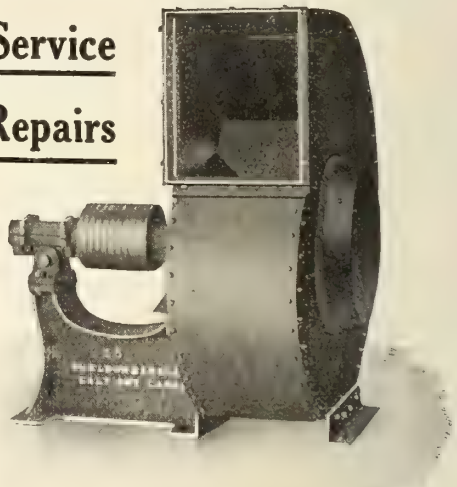
Tear out this page, put your name and address on the margin, mail it to us, and we will gladly send you our complete catalog.

The Diehl Machine Works

On the Banks of the Wabash **WABASH, IND., U.S.A.**

Maximum Service

Minimum Repairs



The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

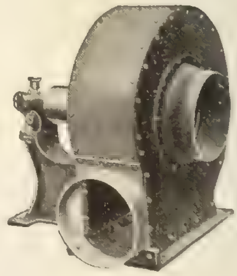
Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

(Patented)

Cyclone Blow Pipe Co.

Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.



Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.

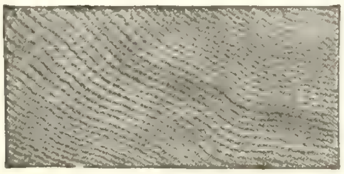
"Wood's Saws are Good Saws"

Fred Wood & Son

SAWS

**135 Richmond St. West,
TORONTO**

We specialize in the manufacture and repairing of fine Circular Saws for the use of Planing Mills and Woodworking Plants.



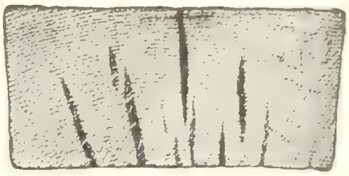
Every kind and form of

DRYING LUMBER

Grand Rapids Dry Kiln

QUALITY DRYING

Grand Rapids
Mich. - U. S. A.



BETTER RESULTS AT A BIGGER SAVING

Hundreds of Woodworking Plants are being helped to this end by

CARBORUNDUM BRAND GARNET PAPER AND CLOTH

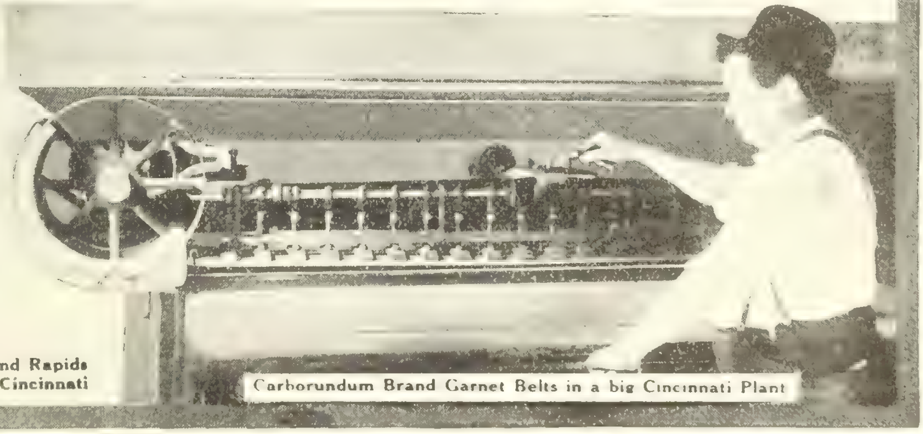
CLEAN, sharp, durable products, uniformly made of the best possible materials—fast cutting because only the hardest, sharpest, most uniformly graded Garnet grain is used in their making—they do better work in less time.

There is real sanding service in Carborundum Brand Garnet Products

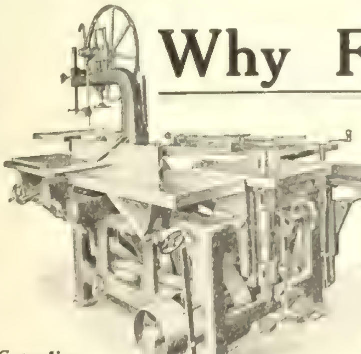
The Carborundum Company

Works:
Niagara Falls, N. Y. Manchester, Eng.
Reisholz Düsseldorf, Ger.

Stores:
New York Chicago Boston Grand Rapids
Philadelphia Milwaukee Cleveland Cincinnati



Carborundum Brand Garnet Belts in a big Cincinnati Plant



Why Fill Your Shop With Machinery?

The 1914 Model Famous "31" Universal Woodworker combines 16 machines in one and does 31 kinds of work.

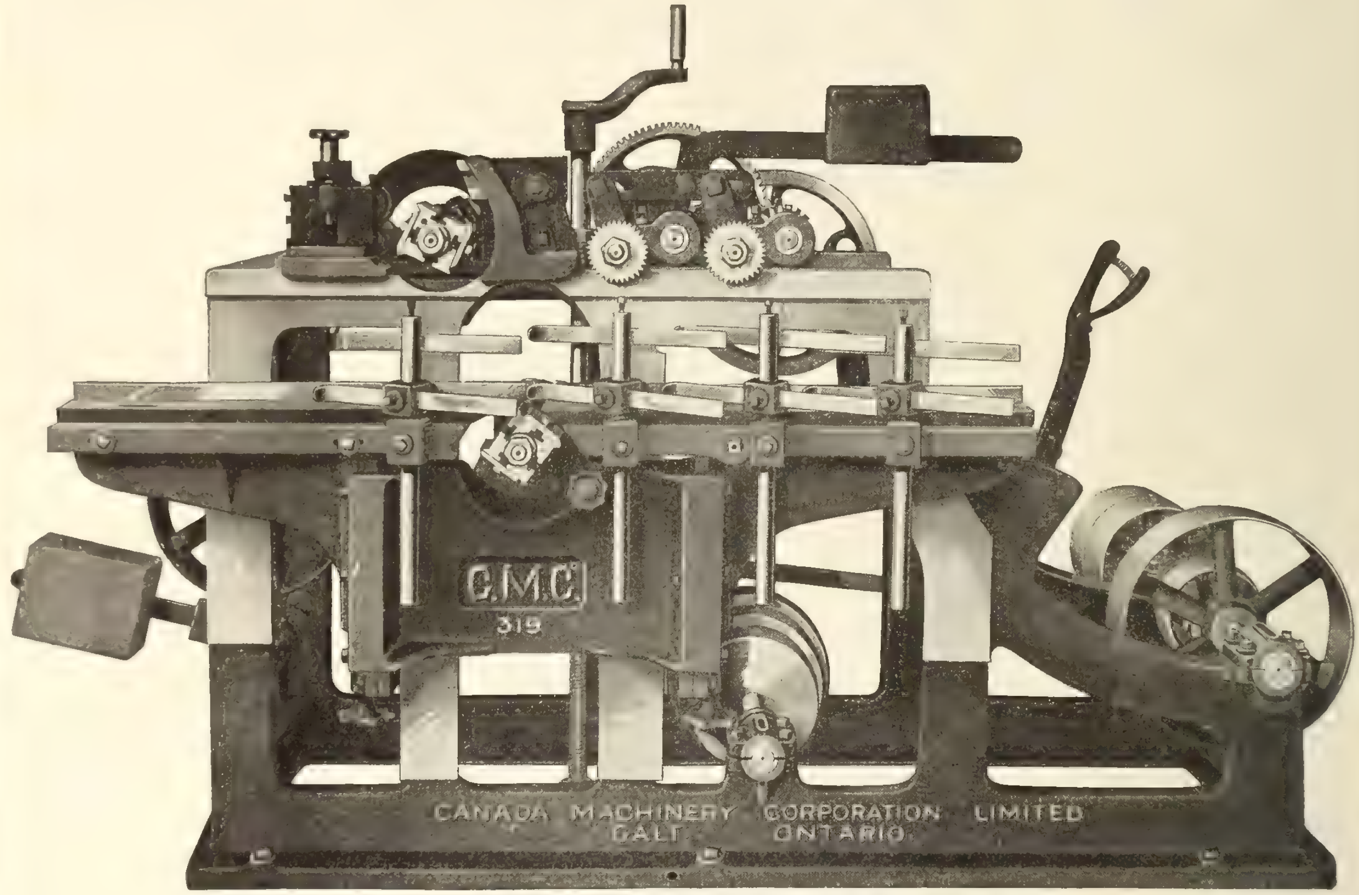
Saves 50 to 100% in first cost, floor space, power, cost of installing and upkeep.

New Catalog No. 25 for 1914 tells all about the "31" and over 50 other money makers for Woodworkers. It's free.

THE SIDNEY TOOL CO., 250 Highland Ave. Sidney, Ohio, U.S.A.

Canadian Agents: The A. R. Williams Mchy. Co., Toronto: Bournival & Co., Montreal: The A. R. Williams Mchy. Co., Winnipeg: The A. R. Williams Mchy. Co., Vancouver

DOOR STICKER C.M.C. SASH STICKER



No. 319 DOUBLE SASH AND DOOR STICKER.

This machine has been especially built and designed for the rapid making of stiles and rails for doors and sash.

Particular attention has been paid to the ease of manipulation and accuracy of adjustment.

The Feed Drive is of our improved down driven gears. All gears are carefully cut from the solid.

We have just issued a new bulletin No. 319, fully illustrating and describing this machine, which we will be pleased to forward on request.

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Largest Builders of High-Class Woodworking Machinery in Canada.

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry. Reaches the factories producing interior finish, doors, sash, flooring, woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited
Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.
Nicholls Building, Toronto
Phone Ade. 929

Vol. 15 March, 1914 No. 3

The Growing Tendency Towards Higher-Grade Furniture Woods

THE article devoted to a discussion of the general tendency in the use of higher-grade furniture woods, which appears in another column of this number, throws an interesting sidelight on the development in this country of good types of Period furniture. It also directs attention to the remarkable way in which several of the better known furniture woods have come into prominence with the principal furniture manufacturers of Canada. Woods such as mahogany, quartered oak, gum and walnut, in the order named, to-day find a place in some of the best of our factories, in the manufacture of the various styles of furniture which have come into public favor. These include Colonial, Adam and the Louis styles. From these facts it is quite easy to arrive at the deduction that the demand for English Period furniture is much greater to-day than ever before. No doubt this demand is due in some measure to the influence of the annual Exhibitions of furniture, which have come to be regarded as well nigh indispensable.

Veneer, or "Reinforced Lumber"?

"WHAT'S in a name?" we find ourselves asking after noting a discussion of a proposal to change the name "veneer." In a general way a certain opprobrium attaches to the word veneer, inasmuch as it is associated with something sham and artificial, but this should not apply to the trade use of the word and it would certainly appear to be the right policy for manufacturers to undertake to educate the public to the real merits of veneered products rather than to undertake the tedious uphill work of familiarizing people with a new name. If a product have objectionable characteristics these will be discovered under whatever name that product is exploited. Great progress has been made of recent years in the manufacture of veneer. Greater progress will not only remove any suggestion of odium attaching to the name, but will produce enthusiasts over the merits of the product. In the early days of veneering there were second-rate manufacturers who bought defective stock and established a certain amount of prejudice in the minds of purchasers, but conditions have changed and the status of manufacturing in this field has been raised to a point where a man has to handle A 1 stock or get out of the business. It is urged by some that the word veneer has become an established synonym for anything which is all right on the surface but of little real value, and it is suggested that the term "reinforced wood" be substituted for veneer, on the ground that the articles of furniture in which veneer is used are really made of several layers of veneer, one reinforcing the other.

We cannot help thinking that the public would not hail with acclamation the proposed change. Excellence of manufacture alone will persuade the buyer that a properly constructed panel is really stronger in many cases than the solid lumber and that the employment of high grade veneer offers a much greater variety of figure in face panels. The increasing popularity of veneer is the direct outcome of manufacturing progress and there would certainly be lost ground to recover if another name were substituted for the product.

Canadian Furniture Factories and the U. S. Situation

THE increasing importation of European-made furniture into the United States which will probably come about as a result of the tariff reduction, is causing the trade on the other side of the border to "sit up and take notice." Examination reveals the fact that German ideas, for instance, are shown in the recent productions of some of the best United States designers. Commenting upon this development our esteemed contemporary, the Furniture Manufacturer and Artisan, says that, after all, the prevailing taste in furniture in the United States is not far removed from that of England, and that New York, which has a reputation for adapting itself to European customs, will adapt itself to European furniture. Our contemporary in its concluding observations makes the following significant reference to the Canadian trade:

> "But we should not lose sight of what may happen from the growing factories in Canada. The Canadian duty against furniture made in the United States is still 35 per cent. ad valorem, but under the new tariff law, unless we are mistaken, they can ship furniture into this country on the 15 per cent. basis. Considering the fact that the Canadian manufacturers "crib" most of their designs from American catalogs, that 15 per cent. should not act as much of a barrier for competition in cities all along our northern border."

We acknowledge the tribute paid to Canada's "growing factories." Of late there have been many indications that these would constitute a larger factor to reckon with before many years. As to the alleged fact that most of our Canadian work is inspired by

American catalogues, we can only point our contemporaries to another fact—that both Canadian and United States catalogues contain little evidence of real creative art. European design, with a few modifications, has governed all our better work, and the innovations that have been made have not been attended with startling success. We have in mind a half-dozen concerns in Ontario alone whose work, we believe, will compare favorably, in point of originality, with the product of many of the United States factories. Still, the dig may stimulate our "growing factories" to more rapid development. The individuality in design will come as our experience increases and our national life lends influence.

Developments in the Use of Higher-Grade Furniture Woods

Staff article by S. Bothwell

With the gradual development in public favor of a number of the leading styles of Period furniture, the time is opportune to discuss in outline a few aspects of the uses of the higher-grade woods, and to offer some suggestions on the subject of furniture generally.

In recent years the greatest increase in the higher grade cabinet woods has undoubtedly been in mahogany. This wood, which is regarded as the queen of all higher-grade furniture woods, does not as yet appear to have encountered any serious rival. In many of our high-class furniture factories in Canada, mahogany is the staple article. This is doubtless due in large measure to its beautiful texture, combined with its workable qualities, a combination which has made it the favorite. Besides it possesses the staying qualities, and unlike some other woods on which the hand of time lays deteriorating fingers, mahogany rather improves with age and care.

The varieties of mahogany which find a place in most of our factories to-day are Honduras, Mexican, Cuban and African. The Honduras variety is the favorite for most uses. The Cuban is used in chair manufacture, in parts of which great strength and small size are required. The Mexican gives a high figure with a lustre all its own, while the African variety, generally speaking, is very nicely figured. The latter, however, is coarser, and does not compare in this respect with the Mexican. Of the mahoganies it is the cheapest, and at the present time there are indications that the consumption of this variety is likely to increase. The white mahogany which comes from the east and west coasts of America has been very slightly in demand. It is quite as expensive, and probably a little more so, than the others being limited in quantity.

Mahogany veneer is consumed to a large extent in the furniture factory, and will continue to be used in increased quantities in view of the fact that it is possible to get effects in grain and figure that are practically impossible by the use of solid material.

In judging the relative value of mahogany veneer it is well to remember that the best built-up veneered work is preferable to solid material in our climate of extreme variations. This is so particularly in case work where shrinkage and swelling are likely to occur. Because it makes a lighter and daintier design than oak, mahogany finds its way into the dining room, drawing room and bed room, while for upholstered furniture nothing equals it for beauty and utility. It may be remarked that the consumption of mahogany in Canada has grown with great rapidity, and the price of the wood is therefore likely to be maintained.

Oak may be said to take next place in the field of merit. This wood is used almost entirely in the manufacture of Elizabethan, Georgian and Gothic furniture. One of the principal woods used in higher-grade furniture is quartered white oak, although it may be questioned whether it holds the position to-day that it did a few years ago. The tendency in the use of material is towards a somewhat quieter figure than formerly. In this respect good matching and color are essential. Quartered oak veneer is also used largely in case goods factories, the sawn veneer being used where even matching is necessary as the veneer can be used either side for the face, with the result that a very pleasing piece of furniture can be produced. Sliced cut veneer is considerably cheaper than sawn and is as good for ordinary purposes. The main sphere of oak is the halls, clubs and dens, etc., where heavy lines are necessary.

Walnut is once more coming into vogue, and some very fine furniture is now being made from this old favorite. Many people are still under the impression that walnut timber is almost extinct, but reliable reports aver that there is a sufficient supply of this wood for ordinary demands for years to come. The export of walnut from the United States to Germany has been very considerable in recent years (since the domestic consumption largely ceased), but now that the German market is glutted there are large quantities available at a reasonable price. In view of this we may therefore anticipate a considerable showing of walnut furniture in the near future.

Gumwood is now pretty well established as a furniture wood, owing chiefly to persistent advertising by the lumber manufacturers situated in the south. A few years ago there was considerable prejudice against gum for the reason that it would never stay where it was most wanted, but since the advent of proper methods of drying, gum has surely won its way into favor with a good many manufacturers and consumers. It is capable of a beautiful finish; its variegated though quiet grain looks particularly well in straight, simple-lined designs. It is easily worked in machining and the lumber can be had in good widths.

Figured gum is usually cut in veneer, and many beautiful panels, rivalling Circassian walnut, are produced. Gum makes a fine interior material for higher-grade furniture which requires to be as clean and almost as well finished as the exterior. This wood also makes a good imitation mahogany if properly finished, and indeed it is being largely used for this purpose. Red gum is used to some extent in the higher-grade furniture. It yields a good percentage of cutting, but has this drawback that it has not that contrast in depth possessed by Circassian. The use to which Circassion walnut is applied is confined practically to veneers, and doubtless it will continue, to a limited extent at least, to enjoy a sale in the strictly high-grade trade. The solid exterior portions of Circassian walnut furniture are usually made of gumwood, which readily finishes to match the color of Circassian. Regarding the increasing consumption of material in higher-grade furniture a safe proportion would be mahogany, quartered oak, gum and walnut in the order named.

The various styles in vogue at present are Colonial, Adam, and Louis the Fourteenth, Fifteenth and Sixteenth. The so-called "Mission" style and Arts and Crafts are not so pronounced as they were a few years ago.

The Colonial style appeals to many on account of its pleasing lines and solid substantial construction. Its almost total lack of carving is made a talking point in favor of its being kept clean. Its plain, broad surfaces give the manufacturer a fine chance for display of the beauty of the material used, of which full advantage is taken. It is a style that will always find favor in the eyes of those who prefer a combination of beauty and utility.

The Adam style is at present making a strong bid for favor and with good reason. It is notable for its chaste simplicity of line, refined and unobtrusive decoration, and dainty appearance. Mahogany is the proper material for Adam furniture, though gum is largely and effectively used. In the various Louis styles the Louis the Fifteenth is perhaps the favorite.

For drawing room furniture these styles are very effective and to those who can pay the price, they are a treat to the eye. The lines are always pleasing and artistic, the carving is intricate and well modelled. Any attempt to make these styles in a cheap manner produces only a burlesque. The prospective purchaser need not expect to get the real article at a cheap price, but he is certain to get his money's worth when he invests. A good thing to remember is that mahogany is the only wood to be considered in these styles of furniture.

The Mission and Arts and Crafts styles are particularly adapted for clubs, cafes, smoking rooms, dens, libraries and rotundas, being almost of severe simplicity and usually strongly made. It will stand the wear and tear of public or semi-public places, being always made of oak which helps the substantial appearance. The finish is generally Fumed or Early English.

At present the styles which may be said to stand in public favor are Colonial, Adam, Mission and Arts and Crafts, as also the various Louis styles, premier place being taken in the latter by Louis the Fifteenth.

Furniture is divided into three periods—Gothic, Elizabethan and Jacobean. The age of oak extends from 1500 to 1660. In the Gothic period the chest or coffer was a most favorite form of furniture, as it could serve various purposes. The so-called "figure" in oak has the appearance of hard diagonal splashes. Not being cellular these do not shrink with age like the rest. It is therefore certain proof of the antiquity of a piece of oak that, on passing the hand over the surface the figure appears to be slightly raised. It was not till 1530 to 1535 that the marked change in the decoration of furniture caused by Italian influence really made itself felt. The age of walnut dates from 1660 to 1720; that of mahogany lasted from 1720 to 1770. It may be of interest to mention that furniture was not varnished in England until the middle of the Sixteenth Century. Wax polish was doubtless used at times, or the wood slightly oiled, but Gothic oak and early Renaissance furniture were left untouched. As the forms of decoration became rounder and more ornamental, simplicity began to disappear, and a deep colored varnish was applied or the wood was oiled and then waxed. This oiling accounts for the great amount of dark furniture called black oak. This varnish gives the beautiful bronze-like patima of rich chestnut brown color found on the later Renaissance furniture. Beyond the fact that these varnishes were mixed with oil and not spirit, the secret of their composition is entirely lost as it has been found impossible to obtain a correct chemical analysis of any old varnish. The original object in applying varnish or wax polish to furniture was to preserve the wood.

The Use of Red Gum

HEART wood is a product finished in nature's laboratory. Scientists claim there is little if any change in wood structure after it has reached the heart stage. Nature then regards it as a finished product. It is known there is a gradual change in sap wood, each year a part of it being turned to heart. In other words, nature's building process is continuous, a bit of heart and a bit of sap wood being added to the tree each year. In time a tree ceases to grow, or the rate of growth becomes almost imperceptible, but the conversion of sap into heart wood continues.

If the trade will regard the red gum as the "aged" wood and the sap gum as the "new" wood, keeping in mind the sense in which wines and whiskies are aged, it will have a fair conception of the relative values of these two portions of a red gum tree. Age adds a rare boquet to wines, it lends to red gum beauty of color and figure, perhaps increasing its ability to resist rot influences to a slight degree. Otherwise the two portions of the tree are identical.

Aside from its value to the manufacturing consumer, red gum is one of the great interior trim woods of America and gradually is being so recognized by the building trade. Again may it be said that this wood is different from any other of the woods with which for interior trim it so successfully competes. It has introduced a shade of brown into the color scheme of interior finish which, before the advent of this wood, was unknown. It has made possible certain effects and combinations of effects which the original minded are quick to sieze upon and produce an atmosphere previously impossible to attain.

The chief value of red gum finished in natural color is not that it has introduced a novelty but that the new effect is pleasing and does not become wearisome on close and continued acquaintance. No wood in recent years has aroused so much favorable attention and comment as red gum, nor has any wood served more faithfully when intelligently employed after being bought from the larger and thoroughly responsible producers, men who are proud of their output and jealous of its reputation.

Architects who keep abreast of the times specify red gum because of its great beauty and low cost. From observation the building trade has learned that red gum finished in natural color will not fade. On the contrary, it becomes richer with age.

The wood has a wonderfully brown tone, is strikingly marked, and possessing the merits of beauty and utility, it is holding the converts it makes and adding to them constantly.

In a recent communication regarding an order for doors for a large southern hotel, a manufacturer said: "I am glad you decided to put in red gum doors. It will show the public one of the best woods we have on the market to-day. In my opinion no other wood is its equal. I made doors of red gum ten years ago and they are more beautiful to-day than when they were first finished."

Red gum trim can be secured at prices below those asked for other native cabinet woods and, of course, for much less than the imported woods. It will stand any test that the user may desire to make.

Further and perhaps more convincing information is supplied by the accompanying illustrations, showing the use of red gum for doors, interior trim, interior wood work, bank fixtures and bulletin furniture. These serve as examples of the manner in which the wood is now being used but do not define the limits of its usefulness.

Where it is the intention to paint, stain or enamel the interior woodwork, sap gum should be employed. The following reasons should suffice: there is an ample supply of the sap wood; it can be secured at lower prices than the red or heart wood; it will serve the user equally well.

Texture of sap gum shows very little variation from that of the red gum. The fibers lie close together, the pores are numerous, affording a firm clinch for the paint, stain or enamel, and the wood will stand the wear to which it is subjected.

Red gum and sap gum are advertised woods that are living up to the representations made in their behalf. This statement carries with it the proviso that if the lumber is secured from any of the manufacturers whose names are attached to the advertisements, it will serve as it is recommended to serve. Such operators cannot, of course, guarantee the product of other mills, some of which may not be properly cured before it is placed on the market.

A Progressive Lumber and Woodworking Industry at Burlington, Ont.

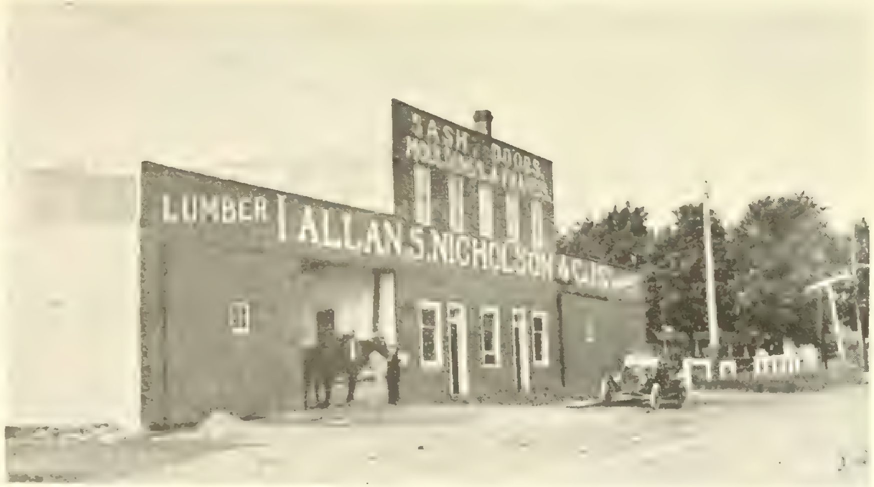
BURLINGTON, Ont., just outside of Hamilton, has an up-to-date woodworking industry in the plant of Messrs. Allan S. Nicholson & Company, views of which are presented herewith. The business was founded many years ago by Mr. A. B. Coleman. The plant was burned out some fifteen years ago, but was re-established by Mr. Jas. Harrison, who carried it on until Mr. Allan S. Nicholson purchased it and took charge five or six years ago.

Mr. Allan S. Nicholson, Burlington, Ont.

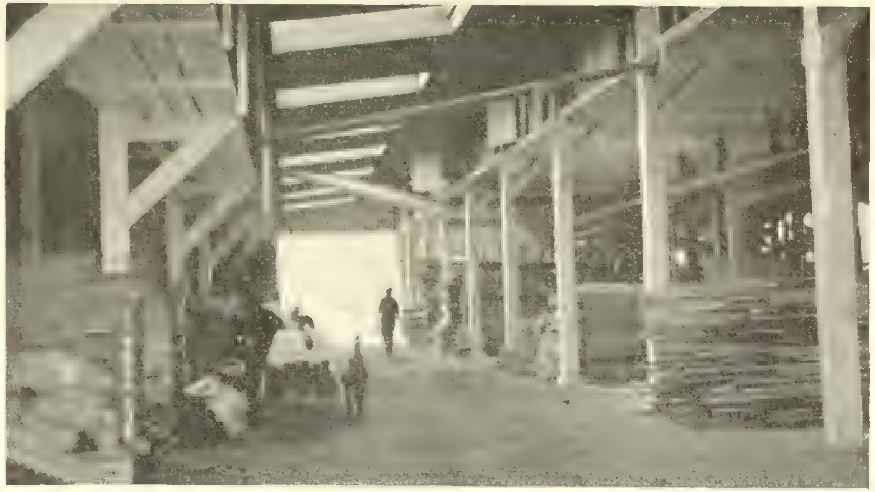
The yard was then located in rather small quarters on a down-town site on Brant street and was strictly of a local nature. Mr. Nicholson remained in business in the same style for a few years until it began to develop into a much larger business under his energetic management, when he opened a branch yard in Hamilton to take care of his Hamilton business. This business also proved a success, but Mr. Nicholson sold this yard about a year ago to Messrs. Winlaw-Irvine Lumber Company, of Toronto. At the same time finding his premises entirely inadequate to handle the business and being on expensive property, Mr. Nicholson found an excellent opportunity to sell the property and move to a less expensive location adjacent to the Grand Trunk Railway. A year or more ago he commenced the erection of the plant shown in one of the accompanying illustrations. He superintended everything in connection with the new building and completed the whole plant in ninety days. It now employs forty to fifty men, and carries a stock of from 1,500,000 to 2,000,000 feet.

The equipment of the planing mill is thoroughly up-to-date consisting of fourteen machines such as a Cowan & Company self-feed band re-saw, a Berlin No. 108 fast-feed planer and matcher, a Ballantyne 12 in. sticker and moulder, a Preston Woodworking Machinery fast-feed power rip-saw, etc. The work done consists of general planing mill work, such as the manufacture of flooring, ceiling, siding, mouldings, etc. The second floor of the mill is especially equipped in the main department for the manufacture of frames, stairs, newels, columns, and all detail work. There is also on the second floor a box factory, which is at the present time being equipped for the manufacture of bushel apple and pear boxes, for which there is a large demand in the Burlington district.

On the first floor of the mill especial attention is given to milling in transit. As readers will see by the accompanying plan, a siding runs through the mill so that lumber for transit milling can be unloaded directly at any of the machines. After it is milled it is reloaded on cars by means of a set of live rollers, which convey the lumber from the machines right into the car, being loaded with the least possible amount of time and labor. The construction of these live rollers is simple, but such that they can be easily and quickly moved to any machine. They can also be used for unloading or reloading material into or from the shed at the side of the mill. There is also installed in the mill

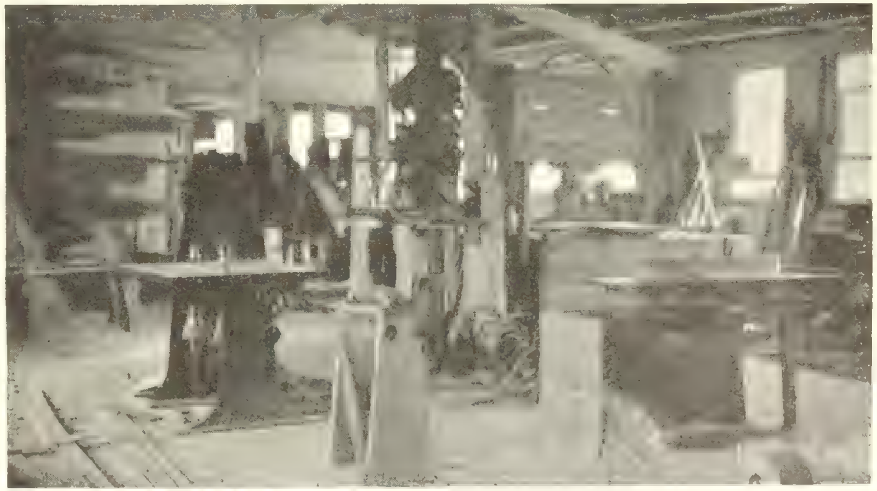


General view of the exterior.



Interior of ground floor.

A well-filled yard at the plant.

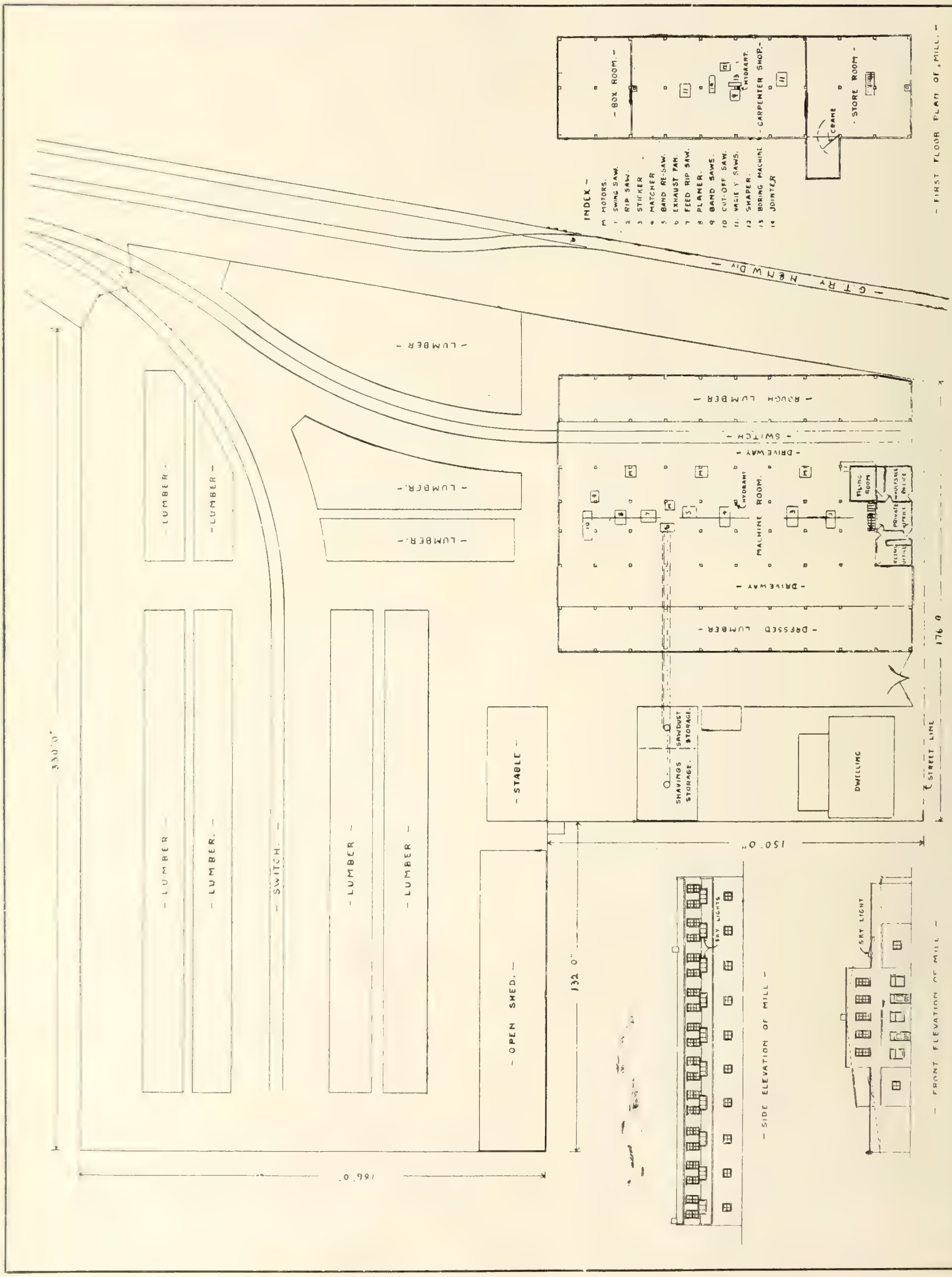


Interior of first floor.

THE UP-TO-DATE PLANT OF MESSRS. S. NICHOLSON & COMPANY, BURLINGTON, ONT.

a complete blower system, which deposits the shavings and sawdust in separate vaults, keeping the mill entirely clean of shavings and sawdust at all times.

As will be seen from the layout reproduced herewith the plant is designed to facilitate operations and insure maximum efficiency. The location of the various equipment in the machine shop will repay observation.



Layout of plant and yards of Messrs. Allan S. Nicholson & Company, Burlington, Ont.

Practical Pointers on the Operation of the Band Scroll Saw

Contributed by John Williams

OF the great variety of machines used in furniture factories to-day there is probably none more difficult for the inexperienced hand to make good at than the band scroll saw, and information from sources other than from actual experience seems hard to obtain. There are several details in connection with its operation, however, that baffle the beginner and are not unknown to some experienced sawyers. Therefore a few suggestions to those not proficient in the work of bandsawing will be timely.

There are many young men engaged in furniture factories who are ambitious to become bandsawyers but owing to lack of opportunity they never fulfil their ambitions. Few machine-room foremen will take on an apprentice if it is at all possible for them to obtain an experienced man, this is no doubt owing to the fact that during the early days of his apprenticeship he requires almost constant constant supervision and the busy foreman would not be disposed to add to the worries entailed by his department by taking on an apprentice at the bandsaw unless there happened to be two bandsaws. In that case the apprentice is likely to be under the guidance of the experienced sawyer.

Much though we dislike apprentices at this particular machine they are really necessary if we are to have a supply of bandsawyers to satisfy future demands. No doubt many an amusing incident could be related by those now proficient regarding the days of their apprenticeship—the thousand and one difficulties they got into, how the saws would break for no apparent reason, develop kinks and numberless other antics not becoming a well-behaved bandsaw. But as time wore on breaks were less frequent, teeth kept nearer a uniform size, and other things that were most difficult at first became comparatively easy.

One of the first difficulties with which the beginner has to contend is that of getting the proper strain in the saws. Of course it facilitates matters to some extent when the machine is equipped with a strain registering device, but devices are not always reliable and are frequently ignored by the experienced sawyer. However, it is of great benefit to the beginner as it gives him an approximate idea of the proper strain. In case the machine is without this attachment it is best to consult the foreman as a great deal depends on the strain, and the beginner must acquire this by experience, as there is no other way to convey it.

As considerable trouble may arise from improper adjustment it must always be borne in mind that the saw should be in a perfectly straight line between the upper and the lower wheels. The best method of procedure is to place the saw on the wheels with the guides all loose, then tighten to the desired strain and adjust the tilt on the top wheel till the saw will run in the desired place. Proceed with the bottom guide, drawing it forward till it touches the back of the saw, then firmly fasten and set up the side guides, being careful not to alter the straight line of the saw when these have been accurately adjusted. Proceed with the top guide in the same manner.

When changing from a wide saw to a narrow one or vice versa, it is necessary only to change the top guide unless the bottom one has metal jaws, in which case it is necessary to adjust both. The most convenient bottom guide is that with a chilled steel back thrust and wooden side jaws or guides, and should be as close to the table as possible.

Causes of Saw Breakages

The beginner will have the humiliating experience of breaking many saws and will doubtless be tempted to condemn the machine, but as he progresses he will learn that there are numerous little things that contribute to the cause of broken saws, a few of which are: excessive strain, pinching the saw in the cut, or in other words, trying to make a shorter turn than the width and set of the saw will permit. This happens frequently, but the habit will leave him when he has had sufficient practice at line sawing to make the turns with an even sweep. The saw should always be free in the cut, and it is to provide for this that the teeth are set, so the beginner will find it more profitable to use a saw suitable for the work rather than try to force a wide saw round a short turn, for in doing this he is not only apt to break the saw but is almost sure to cause it to "belly" in the cut.

Another cause of saw breakages is running them too hard against the back guide. This is done by overtilting the top wheel and putting excessive strain on the tooth edge. A good test for this is to draw it gently forward with the fingers when in motion. If this cannot be done easily there is evidently too much tilt on the top wheel. A saw running too hard against the back guides will develop numberless small cracks, and when found in this condition the most economical thing to do is to throw it in the scrap pile.

Forcing a dull saw, which is another cause of breakages, is not only a waste of energy but a fair sign of carelessness on the part of the operator. Having the guide too high is still another cause, although in most cases it is only a habit. All the space required between the guide and the stock is just sufficient to allow the stock to pass beneath. The closer the guide can be kept to the stock the better, as it not only supports the saw but makes it easier to guide and keep to the line.

The Art Of Brazing

To the beginner the art of brazing is somewhat difficult to master but if a few simple instructions are carried out with due care and attention to detail, the job may be accomplished with little trouble. Probably the most important point about making a good braze is that of having the laps properly filed, square and perfectly true. This is imperative, for if the laps are not true the braze will be crooked, or as it is commonly called. will possess a kink. A frequent mistake is that of filing too long a lap. On all saws up to half an inch wide, with from three to five teeth to the inch, the length of one tooth is sufficient for the lap. Some insist that to get a strong braze a long lap is necessary. This, however, is a mistake and is a fruitful cause of poor brazes, a long lap being much more difficult to make and fit properly.

The lap having been properly made the next step is to get it properly in the brazing vice. Make sure the laps are of equal length, then clamp one end in the vice so that the lap is about midway. With a little muriatic acid clean both laps thoroughly, after one end has been fastened in the vice. This guards against smearing in the handling. Then clamp the other end in so that the point of one lap scarcely reaches the heel of the other—a distance of about one thirty-second part of an inch—the operator having satisfied himself that the back edge of the saw is perfectly straight.

There are several ways of applying the flux and solder but as most of these require the use of tongs or brazing pliers there is always the risk of putting a kink in the braze, more especially with the beginner.

A process in which neither tongs nor pliers are required is, first, to cut a piece of silver solder the width of the saw, less the teeth, viz., from the bottom of the gullet to the back edge. Place this on top of the lap, then take some fine steel spool wire and wind around the saw, starting at a point, say, a half-tooth from the braze and wind tightly to a point about a half-tooth past the braze and back. Wind just sufficient to let the ends of the wire meet and be twisted together in order to keep it tight. Then sprinkle a little pulverized borax over the lap and wire and it is ready for the heat. This is best applied by means of the gasoline blow-torch on saws up to half an inch wide. A good means of confining the heat to the braze is to cut a small block of wood to fit in behind the saw and project a little below and a little above; then to direct the flame of the torch in the opening. This eliminates the danger of insufficient heat on the back edge of the saw. When the desired heat has been obtained (this may be determined by noting when the steel fluxes) remove the heat and loosen one end of the saw so that the contraction will not break the braze. As soon as the heat on the braze has turned black it may be removed from the vice when it is ready for dressing.

Dressing the Braze

This operation is of as much importance as that of filing the laps, and should be done just as carefully. First remove the set for an inch or two each side of the braze, then draw the saw over a segment held in a vice and made so that the saw may be held firmly to it by small thumb screws. With a flat file next proceed to file the braze lengthwise of the saw—never crosswise, for even an expert with a file will in this way get one edge thinner than the other. Now turn the saw inside out and dress the other side in the same manner, being very careful not to get the braze any thinner than the rest of the saw, nor should it be any thicker. Be careful in dressing the back edge for if any more is filed away than is necessary to even it up the result will be a hollow spot on the back edge which is not desirable. The filing having been done a piece of emery cloth may be used to polish it off and remove all the color caused by the heat. Of course this is not necessary, but adds to the appearance of an otherwise good braze. After the teeth at the braze have been filed and reset the job is complete.

Bandsawyers as a rule take pride in doing smooth, clean work, and in order to accomplish this it is necessary to have the saws properly set and filed. There are many good saw sets on the market but like all other machinery they must be properly adjusted to do good work. Beginners often make the mistake of getting too much set in their saws, and this should be guarded against as it is more difficult to do smooth work with it. Besides the extreme points soon lose their keen edge, and when sawing stock like quartered oak (where there is a hard and soft grain alternately) the saw is liable to follow the soft streaks and the finished work resembles a corduroy road.

In setting the saw the teeth should never be sprung over more than half way down, thus making what is called a short set, and which leaves the tooth much stronger than when sprung from the bottom. Doubtless many readers have noticed diagonal ridges on a bandsaw cut. One of the causes of this is: too long a set in the tooth, thereby tending to make the saw vibrate.

For the benefit of the beginner who is not fortunate enough to have a filing machine to use I shall mention a few points on filing. To become proficient at this requires considerable practice, and the beginner should strive for efficiency rather than speed. The teeth should be filed square across and the file held perfectly level. I have noticed many band sawyers who had the habit of holding their file on a slant, like filing up hill, which makes the teeth long on one side, and tends to lead the saw sideways. Short teeth are also hard for the beginner to keep clear of. He should joint his saws off occasionally and be careful in filing to bring the teeth to a point, paying particular attention to the manner of holding the file. The gullets should be an even depth and the teeth an equal distance apart. The beginner will no doubt find it difficult at first but with patience and perseverance he will in time master it.

Covering the Wheels

To successfully put the rubber covers on the band saw wheels is not only a difficult proposition for the beginner but is often a stubborn proposition for the more experienced ones. I once saw the same band put on a wheel five times in two days and the longest it stayed on at any one time after being started was twenty minutes. There is no occasion for a similar experience if the following directions are carried out with a little care and attention to detail: In the first place solid rubber makes the only ideal covering and this should be of good quality. Remove the old covering and thoroughly clean the iron rim with a solution of potash or Gillets lye. Then get the exact circumference of the wheel. The solid rubber will stretch considerably, so means must be employed to find the exact amount. A good way to do this is to fasten one end of the rubber band to a bench and mark off the exact length required on the bench then pull the rubber band till you have stretched it sufficiently to keep it tight on the wheel and transfer the mark from the bench to the rubber while stretched. Upon releasing it will be found to have stretched from ten to twenty inches. Allow two inches for the lap and join together with rubber cement. As rubber is a difficult thing to cut it is best to make the lap on the sand disc. This can be done by tacking the band to a strip of wood about the same width and holding to the disc. This works much quicker and makes a better job than trying to cut it. After applying the rubber cement to both laps let it stand for ten to fifteen minutes, then press firmly together, no further time being required for it to dry or set. Now mix up a solution of red lead and varnish to a consistency that can be brushed on the wheel. Be sure the wheel is perfectly dry and clean, then apply a coat of red lead and varnish, and with a piece of coarse sandpaper rough up the inside of the band to receive the red lead and varnish. By this time the coat on the wheel will have become tacky, so stretch the band on the wheel and roll down firmly to eject all air from between the band and the wheel. It must then dry for ten to twenty hours when it is ready for use.

The mistake is often made of running the saw continuously in one place on the wheels. This wears a groove in the rubber from the set in the teeth, and after a time it will be found difficult to get the saw to run anywhere else. The only thing to do in that case is to dress the rubber down with coarse sandpaper when the machine is running and this having been done change the course of the saw occasionally and wear the rubbers down evenly. If the machine is properly lined up the saw will run anywhere the operator may desire, whether it is near the front or near the back.

A great deal depends on running the saws at the proper speed. A thirty-six-inch band scroll saw should run about 450 revolutions per minute and though this may seem a trifle fast for some, a saw in good shape will stand this speed better than by running slower; besides it will do more and better work. It is not a good idea, however, to get saws with teeth too small. For instance, a quarter-inch saw should have four teeth to the inch, a three-eighths saw 3½ teeth, and a half-inch saw three teeth.

As to the management of saws in regard to furnishing a good supply it may be pointed out that in some furniture factories where the stock of saws includes more than one of each size, the management regards it as extravagance. This is surely a mistake for in most plants there is a variety of work to be done and in order to turn it out with satisfaction the operator should have on his rack a full range of saws. When such is not possible it often becomes necessary to use a saw that is not adapted to the work with the resulting unsatisfactory job.

What would constitute a good variety for most plants would be the following: three ⅛-inch saws, bevel blades for sawing carvings; three 3/16-inch saws; four ¼-inch; two 5/6-inch, six ⅜-inch, three ½-inch, and two ¾-inch. This would cover almost anything that could be done on a thirty-six-inch machine. For special lines of work a different variety would probably suit better; in any case it is not good policy to use a wider saw than three-quarters as the bearings are not built to stand the strain necessary on a wider saw.

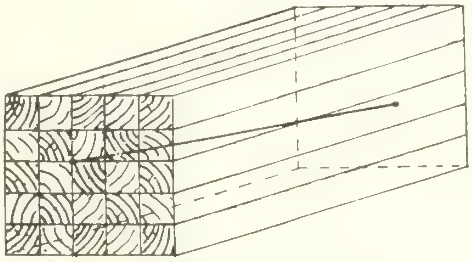
The writer hopes to deal in a future article with details regarding lining up the machine and other points of practical importance to woodworkers.

A factory in England is said to be manufacturing circular saws from paper. These paper saws are used for the making of fine furniture, veneer, and other thin plates of wood which must be treated with special care. Some time ago circular saws made from drawing paper were shown in an English Exposition. The saws were driven by an electric motor and produced fine boards, which could not have been made better by the finest steel saw. The veneers made in this way are said to be so smooth that the cabinet makers can use them without further planing.

The increased weight limit of the parcel post system has enabled veneer and panel manufacturers to utilize the new service to a considerable extent. In shipping veneer samples the usual plan is to tape and hinge them so that they can be folded into a compact bundle. Protected by a sheet of an eighth of an inch stock on each side, they can be shipped easily and safely as well as quickly and economically through the parcel post. According to reports received recently it would appear that the new service has enabled veneer manufacturers to get out their stocks much more conveniently than heretofore on account of the facilities it affords for submitting samples.

"Inlaid" Turning—A Suggestion for the Wood Turner

HERE is a suggestion that will interest the wood-turner who takes a pride in doing work that is beautiful not only in outline but in natural coloring. By gluing up strips of vari-colored woods to form a block out of which the turning is made, an effect as of very fine inlaying is produced. This can be rendered apparently more intricate by making the centers at each end on a line out of parallel with the sides of the block as shown.

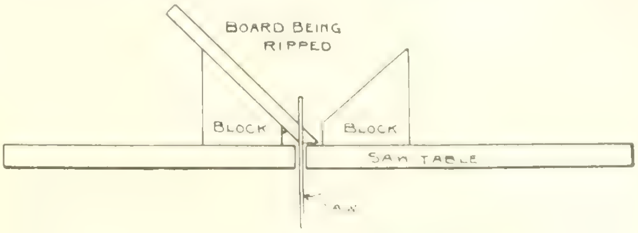

Block for "inlaid" turning.

Strips of walnut and maple or oak and birch are most useful, and by careful placing of the oak in the latter case it is possible to bring out the splash grain on all sides of the turning. Sizes from half an inch to one inch square are the most useful. According to the size of turning desired. Great care must of course be used in the gluing up, as the turning is a very severe test of glued joints.

Handy Rig for Triangular Strips

An ordinary rip-saw with canting fence can only be used to cut triangular strips from boards by turning the board end for end after ripping a strip from either edge of the board. However, by the use of the easily-made rig illustrated herewith it is possible to rip from one edge all the time without turning the board.

This rig consists simply of two blocks bevelled off to 45 deg. These blocks are made long enough to reach past the saw in both directions. If the bench is of wood they may be screwed right on to it. Space must be left between each block and the saw to give clearance for the strips as they are being cut off from alternate sides.



Rig for ripping out triangular strips to cover nail heads.

For use with an iron-top bench the blocks can be fixed to a board long enough to reach from end to end of the bench in the direction of the saw, and this board can then be clamped on to the table.

Door and Window Frames for Concrete Block Buildings

By Chas. Cloukey

The popularity of the cement block as a building material has unconsciously raised the question of economical door and window frames for such buildings. The average man is all at sea when a prospective builder asks for information as to how the frames of one of these buildings should be made. If the customer is within reach of a mill-work concern he can have his particular needs figured out and supplied from that source, but in many cases one has to design the frames and has not that large experience of the mill man to guide him to both efficiency and economy.

There are several distinct classes of frames used in buildings made of cement blocks, and it is the purpose of this article with the accompanying drawings to cover this ground with practical information.

Drawings Based on Use of 8 by 10 Inch Blocks

In all of the drawings submitted, the blocks are 10 inches thick and made to lay 8 inches high, while all of the different members of the frame are proportioned to this size. If the reader keeps this in mind he will be looking at a small picture of the real frame and wall in their relative sizes. It must be kept in mind that all of the sizes given are not arbitrary, but many of them may be varied to suit different blocks or to conserve the use of such material as the builder may have to use in the construction of the frames. These points will generally be noted when taking up the discussion of the different styles of frames.

Box Frame for Furred Walls Where Rabbeted Jamb Blocks are Used

Fig. 1 shows a block wall with 1-inch furring, and lath and plaster on the inside, making a total thickness of 11¾ inches. The rabbet in the block leaves an offset of 2½ inches each way and the reveal outside of the hanging stile is 2 inches, as shown at a a. This leaves a space for mortar on two sides of the box and is a feature calculated to make an excellent weather stop.

Instead of bringing the whole weight-box in to the plaster line, the width of the pulley-stile, b, is gauged so that an ordinary window stop 1⅜ inches wide will cover the joint between the box and the sub-jamb c. This is particularly for frames having a hardwood finish on the inside where the common lumber of the box must be covered from the sash out to the casing with the finishing wood.

The narrow sill is used in all of the frames shown here, and for use in buildings where the stone sill is made the full thickness of the wall, they are just as good and much cheaper in material and labor than the ones which extend from the inside of the box out

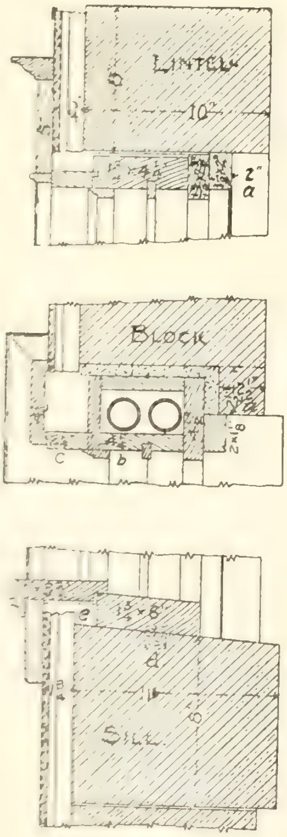


Fig. 1—Box frame for furred walls.

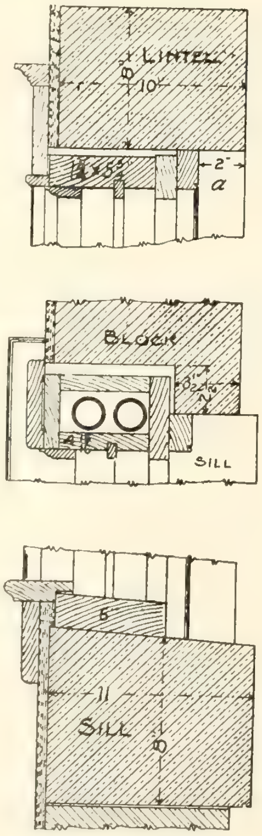


Fig. 2—Simple frame for unfurred walls.

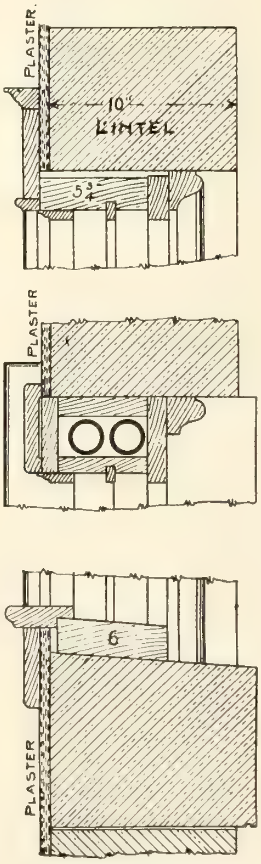


Fig. 3—Box frame for plain block wall.

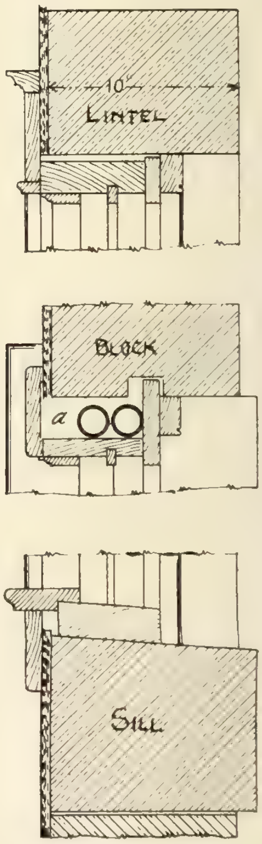


Fig. 4—Grooved blocks form back of weight box.

beyond the brick mould or hanging stile. If the block is made with a groove, as shown at d, the sill may also be grooved and filled with a weather strip or with mortar. However, a good practice is to leave the sills both plain and when plastering the inside, fill in as shown at the dotted line e.

These frames are drawn for windows 1¾ inches thick, and if windows 1⅜ inches thick are used, the box will have to be reduced in width and the sub-jamb widened or else the window stop wil have to be made wide enough to cover the joint, as shown in the figure. If the windows are very large the box may be widened a ½ inch in the wall to accommodate the heavier weights.

Fig. 2 shows a simple box frame, made thick enough to fill the wall by giving a 2½-inch reveal on the outside and having only the ½ inch for plaster on the inside. The rabbet in this block is 1 inch less than in Fig. 1, so that the frame sits closer to the block and at the same time shows a wider reveal to the moulding at a. It will be noticed that the side members of this frame are wider than the first, but the front and back are the same. In all of the box frames the sills are made of a width to permit the inside casing of the box to extend down on the inside and nail without making a cut in the sill, while the same is true of the moulding on the outside. This allows for making the gains across the sills without any hand work if the frames are made in a mill, and requires the least possible labor if made by hand.

There are certain variations of this frame that might seem desirable if it were to be painted, such as rebating the inside casing and using a narrower window stop. If the finish is oil or hardwood, then the drawing is the cheaper way.

Box Frame in Plain Block Wall

Fig. 3 shows a box frame set in a plain block wall, having neither groove nor rabbet, and the width or rather thickness of the frame is determined by the amount of reveal desired on the outside. In this case a heavy moulding is shown and the same may be used on any frame for blocks, but of course it will vary the thickness of the frame or the width of the reveal. It is well to keep in mind a convenient place to hang screens, storm sash or shutters, and the flat brick moulding provides such a place.

Grooved Blocks Form Back of Weight Box

Fig. 4 shows a frame that has become quite popular in some sections of the country, and it is both economical and efficient. In this case the block wall itself forms one side of the weight box and the blind stop extends into the groove in the blocks, making an excellent weather stop. A thick head is shown in this frame, but this really is not necessary unless the frames are exceptionally wide. The sill is made narrow enough to get out of a 2 by 6, and does not reach to the inside of the pulley stile, but this is one of the economies in frame making and is worth while to remember.

Some builders prefer the outside moulding made wider, so as to come on line with the inside opening of the frame, and it is not a bad idea, as it leaves the width of the screen opening the same as that of the window.

Fig. 5 shows the simplest and cheapest style of window frame for block walls. This frame does not provide for weights, and the simple quarter-round moulding is used for outside moulding and for inside window stops. This is a suitable frame for double sash or check-rail windows in warehouses, dungeons,

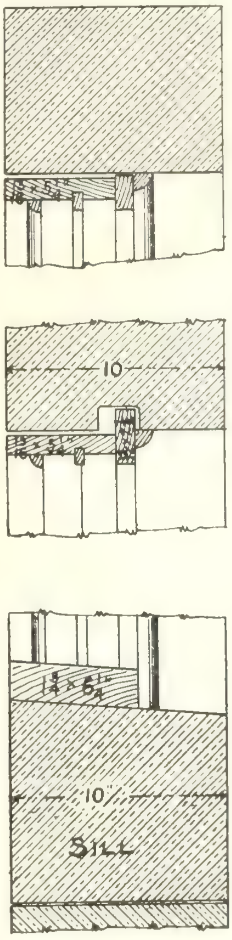


Fig. 5 – Cheapest frame for D. H. windows.

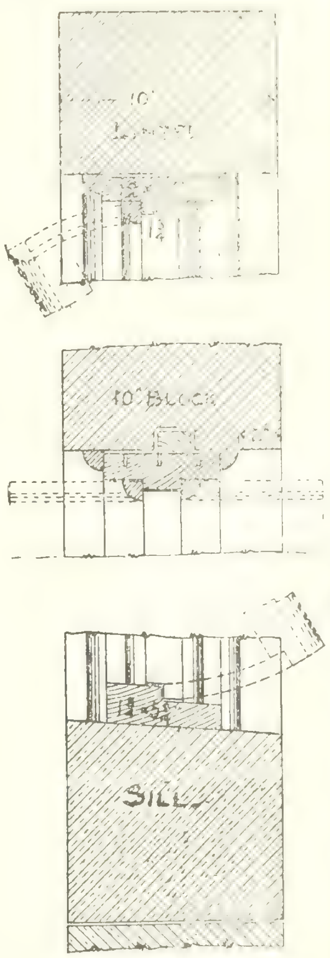


Fig. 6—Plank frame for pivoted sash.

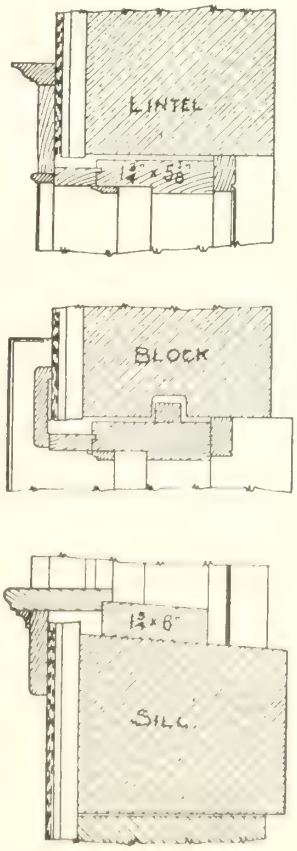


Fig. 7—Best style sash frame.

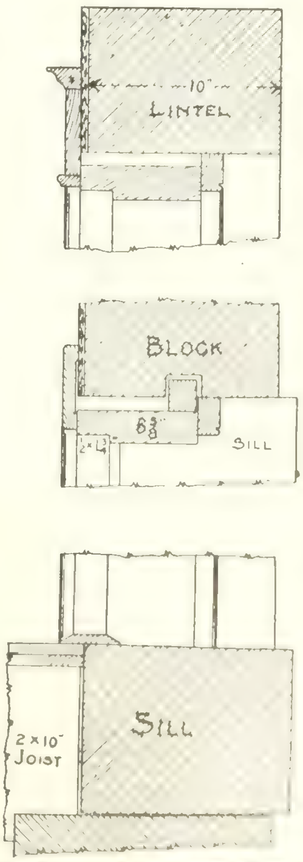


Fig. 8 – Plank rabbeted [illegible] frame

ages and such like buildings. If the walls are thick and there is no inside casing, the window jambs need be only just wide enough to receive the window stops on the inside of the sash.

Frame No. 5 may be made into a plain rail window frame by leaving out the parting stop and putting a flat stop under the upper sash; this will take up ½ inch less room in the thickness of the frame.

Fig. 6 illustrates a plank sash frame for a pivoted sash and it is very cheaply made out of 2 by 6 material, by rabbeting each side so that ½-inch strip is left in the middle as wide as the sash is thick. The sash is hung in this space and stopped with quarter-round, which laps over against the rabbet. The moulding is fastened to the sash on the upper half of the inside and the lower half of the outside, so that when the sash is closed there is a double stop. The sill and the sash are both rabbeted, and this makes a very snug frame when finished. This style of jamb may be finished on the outside with the regular moulding and on the inside with the hardwood trim, if it is desired to have a pivoted sash in the better class of buildings. This style of frame is often used for openings high up out of the way, where it is easier to open and shut with a cord than by other means.

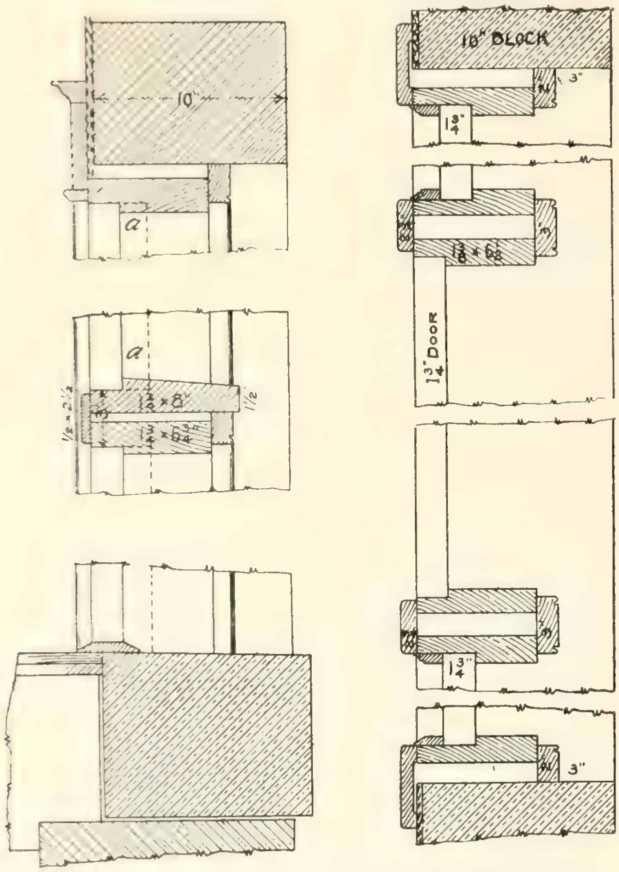


Fig. 9—Vertical section. Fig. 10—Horizontal section.
Mullion Transom Front Entrance Frame.

Best Sash Frame

In Fig. 7 we find a sash frame to correspond with the box frame shown in Fig. 1. If we were building a bank building, city hall or schoolhouse having check-rail windows, plate glass sash and a good front entrance, we would use the details shown in Figs. 1, 7, 9 and 10.

The sash frame in Fig. 7 is laid out to take the same width of sub-jamb and stops as the corresponding box frame, and it is quite a help in getting out the trim for a building to have all of the stuff for the windows and sash of the same width. If the frame were varied in thickness for the box frame, then the same change should be carried through the sash frame. It will be noticed that the position of the sash in the jamb is regulated by the width of stop used to cover over onto the sub-jamb, so that if the sash is thinner, the rabbet will have to be narrower or else a wider stop will have to be provided.

Fig. 8 shows a common plank rabbeted door frame which does not differ from that for a brick wall except for the weather strip on the back of the jamb, and even that is often specified for frames in brick walls. There is no wooden sill shown for these frames, for it is taken for granted that a man who makes cement blocks will also make his sills and lintels of the same materials.

The width of the jamb is determined by the finished thickness of the wall, and the desired reveal outside of the brick mould. The weather strip can be nailed on the back of the jamb at any point to fit the groove in the stone.

Mullion Transom Front Entrance Frame

Fig. 9 shows a vertical section through a mullion transom front entrance frame, detailing the head and transom bar. The jambs are rabbeted for the door and the same for the transom over the door. The dotted line shows the rabbet for the side lights which are made deep enough to allow for the 1⅜-inch stop to cover from the inside of side light to the inside casing, which is better shown in the cross-section of Fig. 10.

Side lights and their transoms have been designed to stand flush with the edge of the jambs the same as the doors, but they do not look right, and the practice of setting them in the middle of the jambs and stopping both sides is all right, unless the door part of the frame has rabbeted jambs. In this latter case the door and side light trim will not line up by ½ inch, and that will not look right either. So we either rabbet the whole frame or leave it all plain for stops. Like the other door frame shown, this entrance frame may have jambs of any suitable width, and where the mullions are made up strong, like the ones shown, lumber 1½ inches thick is plenty heavy enough for the jambs. If plain jambs and stops are used, then 1¼-inch lumber is thick enough.

Adapt These Details to Your Work

If one will study this series of details in connection with the block he is producing, and consider the needs of the building to be put up, he will be able to adapt the proper one to his use by suiting the dimensions of the different members to sizes of his blocks. He will be able to figure out his frame and window openings from the glass sizes desired, and the carpenter can make the frames with the assurance that when they are done he will have a job along the lines of the best mill practice, even though he is not within a hundred miles of a house trim factory.

Why the difference of opinion regarding the arrangement of sticker heads? Surely it would seem most natural to have them operate in the same order as when the dressing of two faces is done on separate machines, that is, over the buzz-planer first and then through the planer to thickness. And yet almost all stickers and molders have the top head first, and they turn out the work quite as neatly, too, as machines with the order reversed.

Manufacturing Facilities of a Toronto Woodworking Plant

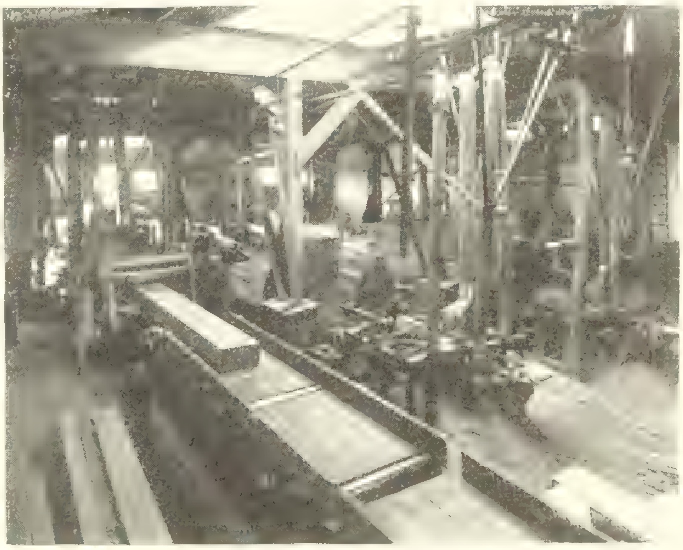
The Boake Manufacturing Company's Operations in North Toronto

PROMINENT amongst the many enterprising woodworking industries with which Toronto is equipped is the plant of the Boake Manufacturing Company, Limited, whose operations are carried on in North Toronto, on a site situated off Howland Avenue. The firm has been in existence since 1893. It was incorporated in 1902 with Mr. G. Wilfred Boake as its first President. Since that time it has passed through a most successful period of development, but in this there is nothing surprising when it is considered that the motto of the company all along has been one of enterprise, consistent with economy.

The location of the plant is ideal in that it possesses the advantages of every modern concern in the way of transportation facilities, having its own private sidings on the Canadian Pacific Railway, by which the lumber is run right into the yards, thereby ensuring rapid and economical handling of the material, both in the raw and the finished stages. Some conception of the company's operations may be formed when it is mentioned that in the neighborhood of 16,000,000 feet of lumber was handled last year; yet with that optimism which characterizes them the firm is anticipating a substantial increase in output during the present year.

The lines manufactured by the Boake Manufacturing Company are interior trim, hardwood flooring, lumber and stair material. They are also wholesale and retail dealers in rough and dressed lumber, lath, shingles, sash and doors. For business purposes the operations of the firm are divided into three departments, each of which is kept entirely separate from the other and handled by different heads. The various departments are also located in separate buildings, the main building having a floor space of 116 ft. by 120 ft. All the power-driven machinery is located here. These machines are judiciously laid out on the ground floor, the operating power being a 250-h.p. Wheelock engine. The motive power is derived from two high-pressure boilers of 125 h.p. each.

In every well-equipped factory the facilities for handling the material are of the utmost importance. This fact was realized by the Boake Company when they installed a few years ago a powerful steel crane, for unloading the raw material from the railway company's cars. This crane, which was supplied by the A. R. Williams Machinery Company, Limited, Toronto, is driven by a twin donkey-engine, installed by the Robertson Machinery Company, of Welland, Ont. The crane is fitted with an electric signalling apparatus, by which means the engine is operated in the process of unloading the lumber from the railway company's cars in two swings. The fact that the crane is of 6-ton capacity conveys some idea of the advantages of this equipment in a lumber mill. In the shipping of the finished materials the same operation is gone through. The equipment throughout the factory displays evidence of careful forethought, every-



A section of the planing mill.

General view of the plant of the Boake Manufacturing Company, Limited, Toronto.

thing being in strict conformity from the kiln drying of the lumber to the roughing out and the more advanced processes employed.

The system in use for the handling of the raw material as it enters the yard is an interesting one. The rough lumber is lowered on to the company's trucks and conveyed to a natural-draft dry kiln. The kiln is a self-contained building, 18 ft. by 64 ft., having a capacity of ten truck loads of lumber, of about 3,000 feet to the truck. The period of drying usually takes one to two weeks in the summer and from two to three weeks during the winter months; the varying periods depending entirely upon the weather and the condition of the lumber when received. The kiln drying process having been completed, the lumber is taken on the company's trucks and conveyed to the rip-saws in the mill, portion of the interior of which is seen in our illustration. The firm's machinery is of up-to-date design, consisting of two self-feed rip saws, one by McGregor, Gourlay & Company, the other by Goldie & McCulloch, of Galt; one 6-in. band resaw with a 90 ft. capacity, by the Connell & Dengler Machine Company, Rochester, N.Y.; a matcher of 200 ft. capacity, by the Berlin Machine Works, Hamilton; three four-sided stickers, two of which were made by Cowan & Company, of Galt, the third being the Ballantine type; and one planer and matcher with a capacity of 75 ft., by Hoyt & Brother Company, Aurora, Ill., which completes the machinery equipment.

Lumber yard showing 6-ton steel crane for unloading lumber from C. P. R. cars.

The principal woods handled by the firm are hemlock, white pine, spruce, yellow pine, fir and the various hardwoods, of which chestnut, plain and quarter-cut oak, birch and maple are the principal. Nothing is allowed to go to waste in the factory, even the shavings being utilized to advantage. As an illustration of this it may be remarked that space has been reserved in the yard in order that provision may be made in the summer for the packing and shipping of bales of shavings during the busy season.

The hardwood flooring is stored in a steam-heated building 18 by 64 ft., this side of the company's operations being very extensive, as is indicated in the output last year of about 800,000 sq. ft. of flooring. The wholesale and retail operations of the firm cover a wide area, and naturally the stock carried is in proportion thereto. The company may be said to be distributors rather than manufacturers, and for this reason a separate building of two floors is given over to the housing of a large stock of veneered stair newels in birch, ash, plain and quarter-cut oak, in which the firm specialize. In cupboard doors a stock of over 2,000 of various sizes in glass and panelled work is carried. In addition porch and verandah columns of all descriptions, all of which are imported, are stocked.

The door warehouse contains a big stock of white pine, fir and hardwood veneered doors of different patterns. Everything, in fact, that goes to the construction and equipment of a building where wood materials are used is to be found in the mill and warehouse of this enterprising firm.

A useful feature of the plant is the machine repair shop on the ground floor. In this department all repairs incidental to the indoor and outdoor operations of the firm are handled by the company's workmen. A power elevator of the Otis-Fensom type is installed in this building for the purpose of gaining ready access to the paint shop, located on the first floor. This building is located on the west side of Dartnell Ave. The saws and knives are sharpened in the tool room by machinery of modern type, including grinders for circular saws, band saws, emery grinders, etc.

The facilities for the delivery of the finished product in and around Toronto are excellent, the firm having two Packard 3-ton motor trucks and 19 horses on the road constantly.

The Managing Director of the firm is Mr. G. Wilfred Boake, his brother, Mr. E. W. Boake, also being associated with the company as Secretary.

Wood Utilization in Gas Producers

THE importance of producing gas from wood has been engaging the attention of gas-plant makers for a considerable time. This subject was ably dealt with in a lecture delivered recently before the Junior Institution of Engineers by Mr. G. E. Lygo. He pointed out that the utilization of wood in gas producers had only recently been given serious attention by gas-plant manufacturers. Doubtless this was due to the higher price of a wood waste plant as compared with an anthracite plant and the low price of anthracite, but with the increased cost of coal, manufacturers having combustible waste materials of little value and difficult to dispose of, were seeking means of utilizing them, and the advent of reliable wood waste suction plants had given them an opportunity of effecting considerable economy. In these plans all kinds of wood from sawdust to 6-inch pieces, cotton seeds, cocoanut shells, fiber, sugar cane, rubber leaf waste, surface peat, etc., could be used.

The area of the generator was governed by the nature and size of the fuel, but roughly speaking it was 2½ times that required for coal fuel. The depth of the fuel depended on its size and density. A deep fuel bed was necessary for large pieces of wood, hence air passed through and ignited the gas in the top of the generator.

Discussing the value of wood in this respect, Mr. Lygo said the calorific value of wood when air-dried was approximately 6,000 b.t.u. per pound. The amount consumed per brake horse-power depended upon the moisture which amounted from 10 to 20 per cent. in air-dried wood and 30 to 50 per cent. in fresh timber. Fuel which contained excessive moisture had to be dried until it did not exceed 60 per cent. otherwise it was difficult to make a generator fire burn evenly.

The Scientific Drying of Plain and Quartered Oak

THE man who would do thorough and scientific drying of oak lumber for cabinet or millwork must make it a point to separate his plain oak from his quartered oak, says a writer in The Hardwood Record. With the upper grades this is commonly done in the process of grading so that it is easy enough to keep and handle it separately in drying if one would but just think about it and provide for it. Sometimes in the lower grades plain and quartered oak is mixed, and sometimes a plain oak board may have a quartered strip along one edge of it. This makes a bad combination for proper drying.

Opinions and results of experiments on drying plain and quartered oak differ because of different local conditions and viewpoints, but all who have experimented with thorough drying such as should be done for cabinet and millwork know there is quite a difference between drying quartered oak and plain oak. One manufacturer who makes a product calling for practically bone-dry stuff, and works both plain and quartered oak, says that it takes him just about three times as long to dry quartered oak as it does plain oak. The drying is done in the same kiln, but not at the same time unless he can arrange to get what plain oak he has to dry on the first truck so that it can be taken out when it is dry and the quartered stock left in. To mix a few plain oak boards in with the quartered stock means that they will be honeycombed and ruined in the process of drying.

When the plain and quartered oak is dried in the same kiln some difference is made in the temperature, but the main difference is in the time and the amount of moisture. More steam, or rather more moisture, is used in the drying of plain oak and the drying is done in practically one-third of the time that is required to dry quartered oak.

It is easy enough to understand that it takes longer to dry quartered oak than it does to dry plain oak and that the two should not be mixed together and dried at the same time. The explanation of why this is may not be so easy for some to understand, and yet it is logical enough. The splash lines in the quartered oak prevent the moisture escaping freely through the sides of the boards and because of this the moisture must be gotten out mainly through the edges and ends of the boards. Experiments have shown that it takes considerably longer to dry wide stock in quartered oak than it does narrow stock, which is proof enough that quite a percentage of the moisture is taken out through the edges. In plain oak the splash lines run through the thickness of the board and the moisture can be drawn out through the sides and the ends instead of through the edges and the ends as is the case with the quartered oak. The annual rings of growth with the hard and soft streaks are not the same check to moisture that the splash lines prove to be, consequently the drying can be carried on much more rapidly, and while in every case it may not be accomplished in a third of the time on plain oak that is required on quartered oak, in every case where thorough drying is accomplished it will be found that the plain oak can be dried easier and quicker than the quartered oak.

The moisture-resisting nature of the splash line in quartered oak is well attested by the fact that in making staves for whiskey barrels this is one of the important points taken into consideration in inspecting and grading the staves. A really good stave must have three splash lines showing in its thickness extending through it from edge to edge, and all of them must be so that there is no chance for moisture to work in between two splash line figures on the inside and reach the outer surface of the staves. It is the splash line in the white oak staves that prevents the alcohol from penetrating and keeps down the loss from evaporation. Naturally if it will do that it is a pretty strong check against the driving out of the native moisture of the tree through the sides in drying.

Those who just reduce oak lumber to shipping dryness or to what may be called fairly dry may not fully appreciate the distinction made here between drying quartered and plain oak. Many of them, too, may not understand fully the difference between getting oak lumber fairly dry and getting it thoroughly dry.

It is perhaps safe to say that ninety per cent. of the troubles in mill and cabinet work with swelling and shrinking and warping are due to lack of thorough drying. Many people do not seem to realize that most of the shrinking of oak lumber is done after it passes the fairly dry stage—between that and the thoroughly dry stage. This is true of other lumber also, and it is one of the things that gave the manufacturers of oak flooring a great advantage over those of pine flooring. When manufacturers of pine flooring think they have finished their drying they have just about reached the stage in the drying process where the manufacturer of first-class oak is beginning to do serious work. The manufacturer of high-grade oak flooring realizes that if he would have his stock fit snugly and not show those unsightly cracks that spoil a finished floor, he must get his lumber so dry that there is no more moisture in it. He soon learns, too, that to stop drying just a little too soon will spoil the quality of his flooring because there is a greater percentage of shrinkage to the amount of moisture taken out in the final stages of the drying than during any other period.

This is the point that some manufacturers of flooring stumble over and thus injure the flooring business, not merely by the process of cheapening the product, but mainly because they deliver to the public a finished product not thoroughly dry, that will afterward do enough shrinking to make it unsightly and to give the oak flooring business a black eye.

This same shortcoming is noted in cabinet and planing mill work, perhaps much more of it than many suspect, and certainly considerably more than there ought to be. To make up and finish good cabinet or millwork to-day calls for so much investment in the way of raw material cost and work bill that the effort should [illegible] be wasted and the result spoiled through a lack of thoroughness and efficiency in drying. The drying process should be made thorough and complete. This should be the first consideration, and then there are various other facts that enter, such as drying to prevent undue checking and to guard against unnecessary hardening of the wood in the process. To get these and the other things as they should be the first step in the process of drying oak is to separate all the plain oak from the quartered, and wherever practical, use different kilns for it or the same kiln at different times. If it becomes necessary to put both plain oak and quartered oak in the dry kiln at once keep the plain oak to itself at the front so that it can be taken out when it is dry.

It would not be a bad idea in drying the quartered oak to assort it with the wide stock separate from the narrow strips and so arrange it as to give the wide stock longer time in the kiln. This is not so imperative as the matter of separating the plain from the quartered, but it is a point worth keeping in mind.

Comparison Between Quarter and Rift Sawed Lumber

PRACTICALLY all the terms "quarter," "rift" and "edge" grain mean very much the same thing, though there are different methods of cutting the lumber. When the lumber is cut so as to show the figure it is termed "bastard" sawed, though the common method of securing this class of lumber is not to quarter the log and saw from the centre out.

To secure the minimum of shrinkage or warp, a board must be "rift" sawed, which means cutting the medullary rays at right angles with the circles of growth.

Sawing of Quartered Oak

Quartered oak is simply "rift" sawed, the designation "quartered" arising from the method of first cutting the log into quarters and then cutting the quarters, as shown in Fig. 1 of the following diagram. The lines a b c d are those upon which the log is supposed to be quartered; the circles represent the concentric rings of the tree's growth. The straight lines across the upper half of the log, B B B, show the ordinary method of slicing it up into boards with a circular or gang.

Wherever the cut of the saw crosses the circles at right angles, or nearly so, that much of the board is "rift" sawed; when it runs nearly parallel with them it exposes the grain, and is what is rather inelegantly termed "bastard." The board nearest the middle, g g, will be almost a perfectly rift-cut piece, while the fourth one from it toward the outside will be just about half rift and half bastard.

Supposing the lower quarter, A, to be cut out from the log, the common and most simple method of quarter-sawing is to make the cuts as shown by the straight lines which cross the concentric rings at sufficiently near right angles for making good flooring. Each piece, however, will have a beveled edge as shown, which must, of course, be squared by the edger. Special arrangement of mill carriage and head blocks are in use for rift-sawing when great accuracy is desired in product.

The common method of bastard-sawing is illustrated in Fig. 2. It simply consists of so turning the log upon the carriage as to expose the grain as much as possible. The diagram only shows cuts that would make an ordinary cant of the piece, but the judgment of the sawyer must be exercised to so turn the log as will make its form square, octagon or hexagon, as may be best to expose instead of cut across the grain, and allow its curve to show in the centre of the board. Both of these methods of sawing, as will be seen, are wasteful to the timber, but that cannot well be avoided.

Judicious bastard-sawing in certain kinds of wood, such as oak or ash, develops some very beautiful grain effects, and for ornamental finishing purposes enhances the value of the wood to as great or even a greater degree than by rift-sawing it, as the latter is mainly required where the stuff is to withstand continuous wear, as in the case of flooring, or is to fill a place where it must neither shrink nor warp, as in the case of sounding or reed boards in musical instruments.

Rift and Bastard Lumber

The appearance of pieces of lumber cut rift and bastard may be seen in Figs. 3 and 4. If laid in a floor Fig. 3 will wear rapidly and unevenly, and always have a tendency to sliver, while Fig. 4, having the ends of the grain exposed, will greatly outlast it, wear more evenly and present a much better appearance.

As the panel to a desk or a piece of furniture, Fig. 3 is considered by many as much handsomer than the other. The methods of quarter-sawing adopted and championed by experienced sawyers are numerous, but the following are some of the most approved plans. It should be remembered that the variety of timber and also the purpose for which the product is to be used, determines what is and what is not practical and practicable quarter-sawing.

Cutting For Figure or Wear

In oak and similar woods, where it is desired to show as much as possible the typical figure produced by quarter-sawing, the line of sawing should be almost directly between the heart and the outside of the log. The same is necessary where the purpose is to avoid warping, as in materials for wide panels, table tops, etc. The difficulty in this method of cutting is that almost every piece has a beveled edge, and has to be run through an edger. The product is also of all widths.

Where, however, mere resistance to wear is required, without regard to beauty of grain, and also where the piece is to be securely fastened in place, much less attention need be paid to an exact rift-sawing. In flooring, for example, it is sufficient if the annular layers of growth be cut across at an angle of say 45 degrees, or even less. Thus the cant need be turned much less frequently on the carriage than when genuine quarter-sawing is in process of execution.

One of the most popular methods of rift-sawing in hardwoods is as follows: Halve the log, put one-half back on the log deck, place the other with the half round on the carriage and against the knees, with the sawed surface sloping down from the top of the knees toward the saw at an angle of 45 degrees, and cut as before. Turn down again, in the same direction, another eighth turn, and repeat.

Thus each half of the log takes four positions. This method requires for its most convenient application an under dog, but good work is often done by the careful use of a wedge under the log. In this method the whole log is reduced to lumber which is all pretty close to the true rift-sawed, but the waste in edging is great.

Utilizing Contents of the Logs

The different steps are as follows: First, take off eight slabs, reducing the log to an octagon. Second, cut on the lines, 1, 2, 3 and 4, in the order given, leaving a heart piece which may be 6 by 6, as shown in the first diagram, or 4 by 4. Third, cut the piece D, as shown. Fourth, cut the piece A, as shown in the second diagram. This piece, somewhat less than one-half the log, requires three turnings. Fifth saw the parts B and C, which are alike in size and shape, as indicated by the lines in Fig. 7.

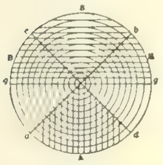


Fig. 1

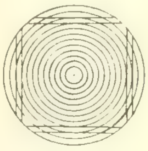


Fig. 2

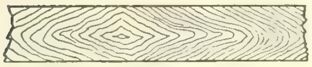


Fig. 3

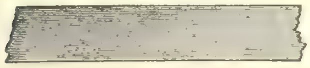


Fig. 4

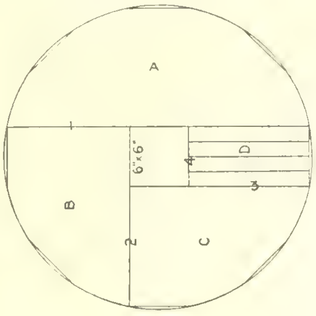


Fig. 5

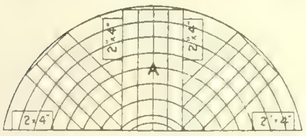


Fig. 6

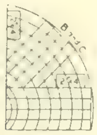


Fig. 7

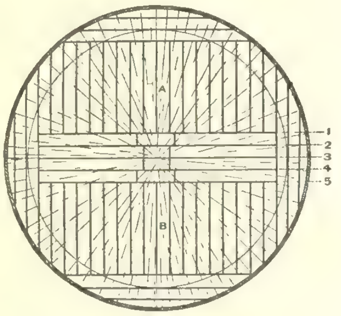


Fig. 8

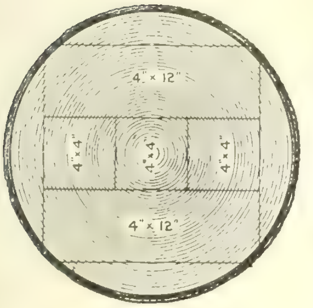


Fig. 9

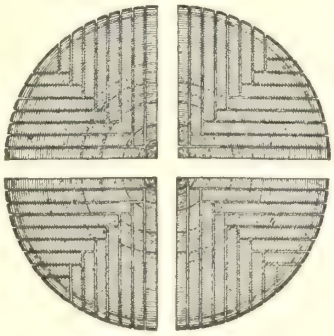


Fig. 10

Various methods of producing quarter and rift sawed lumber

It will be observed that the wedge-shaped pieces may be converted into 2 by 4 or larger.

Too little attention has been paid to quarter-sawing flooring, but as an exact quartering is not necessary, the process is comparatively simple and inexpensive.

For this purpose the method illustrated in the engraving at Fig. 8 may be recommended. First, square the log, 8-inch face heart. Then saw the lines 1, 2, 3, 4 and 5, after which rip up the cants A and B together. This plan is particularly adapted to gang mills. All the lumber inside the circle indicating the heartwood is near enough the true quarter-sawing for flooring.

A modification of this design is shown in Fig. 9, the only difference being that a square piece is left inclosing the heart. Either of the methods outlined in Figs. 8 and 9 is, as stated above, especially adapted to mills using gangs.

If two gangs are in use, part of the saws can be taken out of one of them, leaving the blades at the centre and sides of the frame to cut in Fig. 8 the numbered lines and those parallel to them. Then the cants A and B may be sent to the second gang to be ripped up together.

In mills where there is no gang, the two last cants produced by either method may be placed on the carriage, the one on top of the other, and sawed together.

Special Equipment for Rift-Sawing

The process of rift-sawing is greatly simplified, and a saving effected of both time and material, through the use of special machinery designed for the purpose. The manner in which the work is done by a rift-sawing machine is shown in Fig. 10. To prepare the log for the rift machine it is put on an ordinary saw carriage, one side skinned, then turned down and halved, not allowing the saw to come entirely through the log. Then it is turned, another side skinned and the log quartered, thus requiring only four cuts by the circular before it comes to the rift machine, and no slabs have been taken off.

The rift machine has two operators, one at either end. The first operator takes a quarter of the log, places it on the half of the table nearest him and starts it through the machine, sawing a board. The second operator, standing at the other end, gives the quarter from which the board has been sawed a quarter turn and returns it by the oppositely driven saw, cutting another board at right angles to the first one sawed. This method is continued, the quarter going back and forth until it is entirely cut up. As each side of the machine is cutting all the time, its capacity is very large, and, as will be seen from the diagram, the waste material is reduced to a minimum.

It is of interest to learn that a company has been formed to recover from the bed of the river Moksha, in Russia, many of the countless old oak trees which strew the bed of the river for a length of some four to five hundred miles. The directors, by way of a rough estimate, state that there are not less than one million old oak trees lying in the bed of the river. It is proposed to raise these by means of pontoons. Offers have already been received, but the directors attach so much importance to the unique qualities of the timber that they refuse to make any contracts. One of the peculiar properties of oak is that when submerged in sand or water it will last for centuries unimpaired. Piles have been taken out of old wooden bridges constructed by the Romans and have been found to be as sound and perfect as the day they were driven into place nearly two thousand years ago. Old oak of this description is, of course, a great rarity, and fetches on the few occasions when it comes into the market very high prices. As much as five hundred dollars has been paid for a single tree centuries old which has been discovered in the bed of a river, and raised.

There is perhaps a broader range in veneer values in mahogany than in any other wood, and while to the buyer of furniture mahogany may be [illegible], when it comes to buying the stuff to make it out of there is a whole lot of difference.

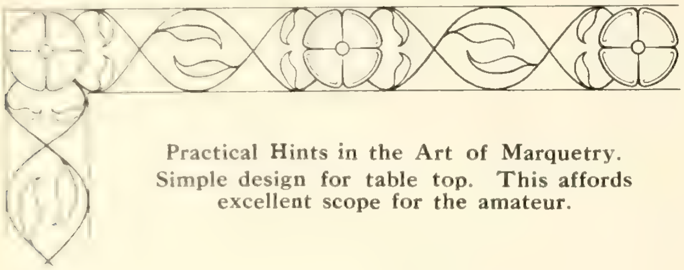
Practical Hints in the Art of Marquetry

Contributed by R. W. Hall, Toronto

(Continued from February issue)

CONTINUING the discussion of this subject from the February number, I wish to emphasize that when a single ornament or panel is required, the method termed "plural cutting" can be used. This method, however, is not availed of frequently as only one pattern can be cut at a time. Yet it might be of considerable interest to beginners, serving to whet their enthusiasm and lead them on to higher ambition in this fascinating art.

The term "plural cutting" is that of cutting ground and ornament at the same time. In order to get the flower to fill the ground, the table of the machine has to be tilted a little off the level so as to make the taper of the cut fill the hole in the ground. In other words the taper of the cut must be equal to what the saw blade takes out, and care must be taken to cut always in the one direction so as to get the benefit of the angular cut. Only a very small hole to admit of the saw blade getting through the two veneers is necessary. In this case the parts forming the design are fixed on top of the grounds, preferably with thin paper. It is also advisable to try a test piece in order to ascertain if the table is properly adjusted so as to fill up the thickness taken out by the saw blade; the former instructions regarding papering and pressing being applied here as with other pieces.

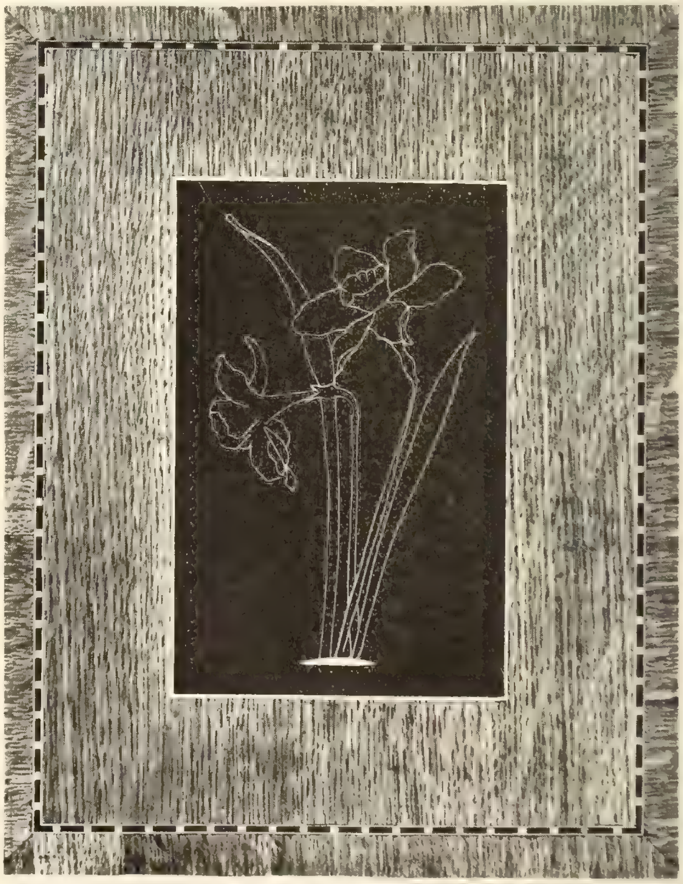


Practical Hints in the Art of Marquetry. Simple design for table top. This affords excellent scope for the amateur.

Another method of inlaid work is that in which simple forms and designs may be cut out by the operator and arranged so as to be let into the solid wood. For instance he may possess a small table-top which he wishes to embellish with his newly acquired art. If so he may cut out a few flowers and leaves of simple outline and place them on the table, say an inch from the edge, and within a band of two or three inches according to the diameter of his largest piece. Put a flower at each corner, say, and one between each (which may be of different colors) and arrange the leaves between the flowers. Then draw a stem in an undulating fashion connecting flowers and leaves in a continuous line round the top, as seen in illustration 1. All these must be carefully marked with a sharp point or pencil and cut out to the depth of the veneers to be let in, care being taken to make them flat. For this class of work a small router is very suitable. Having been cut round the edges with a sharp tool it can be cleaned out to within an eighth of an inch from the edge and a small chisel will do the rest. It is an advantage to have it made a little rough with the teething plane iron if possible, as this gives the glue a much firmer hold. By taking a rubbing, as mentioned in our first article, and cutting out the parts they may now be inserted in their final resting-place and papered over the top as protection from the air until the inlaid portions have become thoroughly settled before being cleaned off. A banding or line may be inserted on both sides if desirable so as to make a nice finish.

Let us now take a few examples leading to the more difficult stages where shading will form a prominent part of the work, also the introduction of the metal. Our first example is the design of a heart filled in with wood. Pewter is mostly used for this class of work being soft and easily cut. The writer uses nothing but pure block tin, which can be procured in sheet form at any store supplying plumbing requisites, and is much better than pewter as it does not tarnish unless adulterated with lead. For the beginner I would not advise more than two of this at a time when the metal forms the groundwork. Take the two pieces, pin them securely together, and glue on the design just as if it were wood boring, and follow up the process already described.

The daffodil (Fig. 2), is also a good exercise in the art. It looks well in a black ground, the saw kerf being filled in with a shaving of the metal taken off the edge way. This may be done easily on a shooting board by placing a piece of wood on top to keep it flat during the operation. It will invariably curl up as it comes from the plane but is easily straightened out by drawing gently along between the thumb and forefinger. Care must be taken not to make it too thick



Example of metal work in daffodil shown above. This piece was exhibited at the Canadian National Exhibition, Toronto, 1913.

as in putting it in, being soft, it easily doubles up and demands patience on the part of the operator. The black ground shows up the outline to full advantage, but by building material for the flowers it may be so arranged on top of the grounds, and all cut at one operation—say four grounds and flowers for two would be cutting six thicknesses of veneer, and if papered on opposite sides the result attained in this case would be a pair (right and left).

The arum lily, the subject of our next example, is one that requires some shading. Of course the colors to be used is a matter to be decided. If imbued with a taste for natural form and colors it will be an acquisition in his or her favor when arranging the number of grounds and flowers to be cut. Having cut the flowers and leaves first to the outline and then carefully cutting the segments of both, taking care to keep each part in its proper place so as not to get mixed up, they will now be ready for the shading which is done by hot sand. Procure an iron saucepan or other suitable receptacle and fill to a depth of one and a half inches of very fine sand. (The object of this is to exclude the air and prevent the flame from rising). Apply a gas jet and heat for a short time until the whole gets properly tempered when it will be necessary to try a piece of veneer to ascertain how it works out. It is better to allow a little time rather than use it when too hot as it is apt to burn the softer woods. Where gas is used this can be easily regulated. The round edges are generally the ones shaded and are the easiest to do but sometimes a hollow has also to be done. This can be accomplished by taking a piece of veneer and covering both sides of the piece to be operated on so as to preserve the points which burn very readily before the shading has reached the centre. Catch the three pieces with the pincers and stir up some of the hottest sand from the bottom. Hold in for a few seconds and then examine it. You should soon be able to surmount this difficulty.

Having done all the parts requiring shading split off and carefully arrange the flowers and leaves and fix up one set so as to get the pattern for the grounds, drawing them carefully in their proper position, cutting and mounting as previously mentioned.

(To be continued).

Making Proper Use of the Small Circular Saw

By M. Wright

CABINETMAKERS would not use their planes if the bit were full of gaps, nor would a machine man run moulding if the knives left little "beads" or ridges on the members, nor would the surfacer be allowed to run on any sort of stock, if that stock were showing defects on the surface from gaps in the planer knives. All these tools are brought to and kept at a standard of perfection as to the cutting edges of the knives, but when we reach that useful little tool, the small saw, what a change! Teeth set haphazard and as like as not to have two or three teeth in the whole plate doing all the cutting while the others seem to be there solely as a guaranty of good faith.

We have a general purpose saw in our place that meets with pretty much that sort of treatment and it is positively nerve-racking to hear it screech when in use. It is the same old case of "what is everyone's business is no one's business" and the saw bears the brunt and the factory pays the bill in lost time and poor work.

It usually takes twice as long to get a few boards ripped on that saw as it does on any of the other saws that are in charge of some particular man. It is quite impossible to get any straight ripping done on the bench and nothing but the coarse work goes to it, under the mistaken idea that coarse or rough ripping should not or need not be done well.

One of the hand-feed benches has a saw made specially for good work, having been ordered 14-gage at the rim and 18-gage at the eye, to run without set, and in the hands of a good mechanic such a saw saves a great deal of dressing and fitting. Much of the work that comes from that bench is glued up just as it leaves the saw, the work being as smooth as if it had been planed.

If it pays to do fine work well, it certainly would pay to do coarse work better than is above indicated. A lot of rough casing came through a few days ago, and as it was handy, the yard man had the 10-inch boards ripped on the rough saw, with the result that out of forty pieces ripped twelve came through the machine with skipped edges from narrow stock, and they had to be sent to the bench and gone over by hand to save the lumber from absolute waste.

That is a frequent happening, but it generally does not matter on work that does not have to go to the machines. It would long since have paid to have discarded the saw and have the work done on another machine or else have put some one at the saw who would and could keep it in running order.

But it seems there must needs be some one machine around a place on which all the rough work and general abuse can be heaped, and possibly this out-of-the-way general purpose sawtable, of which one sees so much, may be the very machine on which to let any and every one take his spite or vent his ill-feeling. It does seem at times that this is the special vocation of the saw in our place, anyway.

But, if this saw were always put on the mandrel hanging from one mark up when changed, if the teeth were kept struck off and the backs filed down so the teeth could clear, if the gullets were filed round instead of with sharp corners and kept deep enough, with a good pitch to the front of the tooth, it is more than likely that the new abused saw would give a good account of itself and not so often show the work to be on the losing side.—Wood Craft.

Depreciate machinery liberally for wear, then add something for it being out of date and setting a bad example.

Red gum is freely used for drawer bottoms of kitchen cabinets; maple, basswood, birch and ash for inside construction, oak for exterior finish, and yellow poplar for tops.

The presence of a lot of knots usually shows that the piece of lumber came from the top of tree trunk. They are the foundations of the branches and when loose or dead signify decayed or broken branches.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Question.—We would like to learn something about the manufacture of shims (wood) as used at present by the railway companies:—the sizes they require, the class of timber used and the kind of machinery used in the manufacture of shims.

Answer.—The following outlines the essential specifications for C. P. R. Standard Track Shims.

Sizes:

7 in. x ¼ in. x 12 in.
7 in. x ½ in. x 12 in.
7 in. x ¾ in. x 12 in.
7 in. x 1 in. x 12 in.
7 in. x 1¼ in. x 12 in.
Contains two ¾ in. holes.

7 in. x 1½ in. x 24 in.
7 in. x 1¾ in. x 24 in.
7 in. x 2 in. x 24 in.
7 in. x 2½ in. x 24 in.
Contains four ¾ in. holes.

The ¼ in. and ½ in. Shims to be of best Rock Elm or Oak

Use Sound Birch, Elm, Oak, Maple or similar hardwoods for other 12 in. shims.

For larger shims use hardest local common timber, not easily split.

Cedar and other soft woods must not be used.

Bore all holes ¾ in. diameter.

Ship in bundles.

The following sketches (Figs. 1 and 2) show the general construction of these shims. If you will write to the General Tie Agent of the railroad companies they will provide you with blue prints and full information. Bids are at present being received for shims for delivery next fall. To manufacture these shims you would require:—fast feed four-sided matcher; multiple automatic cut-off saw; multiple automatic boring machine; 6 in. band rip saw (heavy).

Question.—Can you refer me to a book explaining how to lay out sash and doors, or give me any information on this subject?

Answer.—Good books which will give one a full knowledge of this subject are hard to find, as there are many short cuts and special practices in use in the various shops which never find their way into print. However, there are several good books on carpentry and the building trade which you will find in any book store. The writer has one in particular which contains some very good information on the points you require, namely, "Masonry, Carpentry and Joinery," published by the International Textbook Company, of Scranton, Pa. If you will write them stating your needs, they may be able to give you a list to choose from, but in any event the book named above is a very good one for men engaged in the building trades.

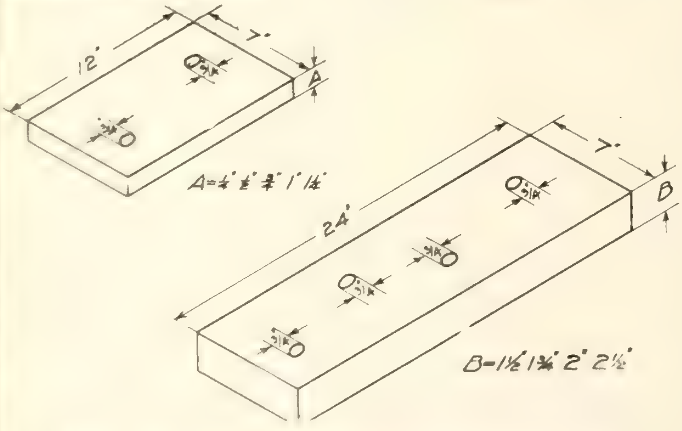
Question.—How may one figure which is the cheapest glue to use for different conditions?

Answer.—Glue is the most abused of all materials. While it is easy to determine which is the cheapest, the real economy lies in seeing that the grade selected is always mixed in the proper proportions and is not spoiled or weakened by improper surroundings. There are two elements entering into the cost of glue—the "spread," or surface it will cover, and the "strength," of the joint. The following table gives the equivalents in "spread" of various priced glues according to the American Glue Grades, and will be found nearly correct in Canadian grades.

Price per lb. dry glue.	Needs lbs. dry glue.	Needs lbs. water.	To make 100 lbs. mixture.
.17	34	66	100
.16	35	65	100
.15	38	62	100
.14	39	61	100
.13	41	59	100
.12	43	57	100
.11	45	55	100
.10	48	52	100
.09	50	50	100
.08	52	48	100

Get several small samples, with their prices, from your dealers and also the proportions under which they will guarantee a perfect joint, i.e., one stronger than the wood itself, using the above table to see that they give you no fairy stories. These figures are made to cover average treatment by average men so they will probably claim better results than the table shows, but do not consider any poorer.

Mix your samples separately in the proper pro-



Figs. 1 and 2—General construction of railway shims.

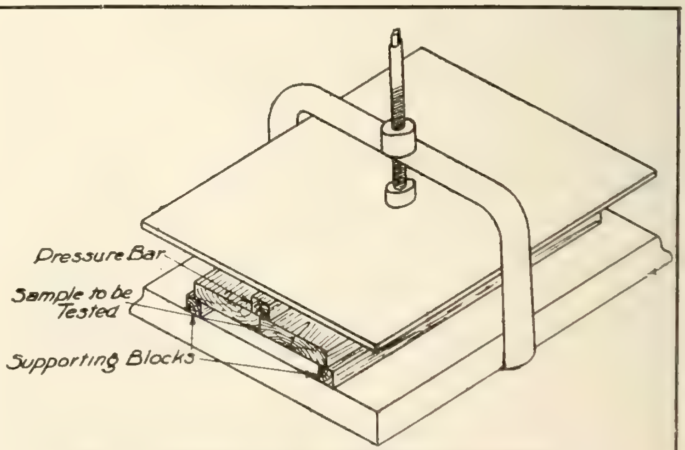


Fig. 3—Testing glue by means of letter press.

portions, weighing glue and water, and combine by letting the glue soak a short time in cold water and then heat to about 125 deg. F. and let it stand at this temperature for two or three hours to approximate the time it will stand in the glue pot before being used up. Then glue a couple of small samples (12 in. x 3 in. x 1 in. will do) with each batch and mark them, and let them stand until dry. Breaking each piece in the office letter press, as shown in sketch (Fig. 3) will show you which is good glue and which is bad, and by figuring you can tell pretty near how much your glue is going to cost you per 100 lbs., selecting of course, the cheapest glue which does not break in the joint. To secure uniform results from the glue you have selected:—Use a Wetmore Heater; mix your glue every day, preparing only what you will use up; don't mix new glue with old; don't allow your men to mix their own glue in small pots; weigh both glue and water; do not heat the mixture over 140 deg.; remember that it is some times necessary to use a high grade glue to stand the violation of the above rules, and that with proper care, a cheaper glue will show as good or better results.

Question.—In the attached sketch (Fig. 4) AB and CD are two shafts, AB being the driver and CD the driven, and AB located 16 in. above CD but at right angles to same. How shall I go to work to find the location of the support for the mule pullies?

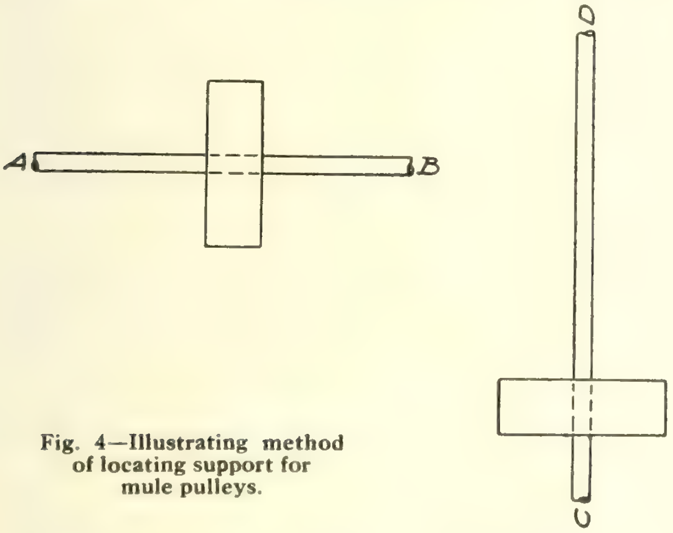


Fig. 4—Illustrating method of locating support for mule pulleys.

Answer.—In the first place you must run a line at right angles to CD across the center of the pulley G (as HI) and another AB over the center of F in the same manner. Then the angle formed by the lines JK and HI will define the location of your top pulley if the shafts were on the same level, while the center of your stand will be on the line LM according to the size of your outfit. You will have to use a mule with two adjustable idlers, like Fig. 5, getting the upright long enough to project about 1 ft. below the rim of the pulley on the lower shaft. Set the pullies with a string in place of the belt, so that the studs on which the pullies run are at right angles to the face of the belt where it makes the turn around them, and if necessary perfect the adjustment from time to time until the belt gets fitted to its place.

Question.—Is it policy to speed up old machines to secure increased production? At what speeds should the standard machines be operated?

Answer.—Generally speaking it is not a good plan to speed up old machines, but in some cases where the construction is unusually heavy it may be done successfully. Generally, however, speeding up, while resulting in temporary gain, increases the repair bill to an alarming extent, and the average working time of the machine taken over a period of time is often less than under the old conditions. There is more to be gained in the advantageous placing of machines to reduce handling of material, and in systematising the workman's movements so as to reduce his lost time. We think that if the quality of the work turned out is satisfactory, you will be astonished to find how much increased production you will obtain by keeping the machine full every moment possible.

Circular saws should have a rim speed of about 10,000 ft. per min.

Band saws, 9,000 ft. to 10,000 ft. per min.

Knife cutter heads, 5,000 to 6,000 ft. per min.

A Novel use for Wood Waste

The United States Government has been carrying on experiments in the manufacture of ethyl alcohol from wood waste, and has succeeded in turning out a product possessing the same commercial constituents as grain alcohol. The main difficulty encountered would seem to have been the rapid destruction of the apparatus by acids, and it is believed that this may be remedied by the substitution of other materials for those usually employed for distilling machinery. If this substitution can be successfully made it appears to be a promising means of obtaining some adequate return for the waste in veneer and panel plants. In making the alcohol (for which there is an unlimited market) anything from sawdust to slabs may be used. The alcohol can be utilized advantageously in place of gasoline for driving gas engines. The fact that the United States Forest Service has appointed an official to devote his entire attention to finding some remunerative commercial use for the waste that is now thrown into the furnace (as the easiest way of getting rid of it) is a recognition by the government of the growing importance of the veneer and panel business. A successful outcome of his efforts in this direction may mean a large saving of money in every veneer and panel making plant.

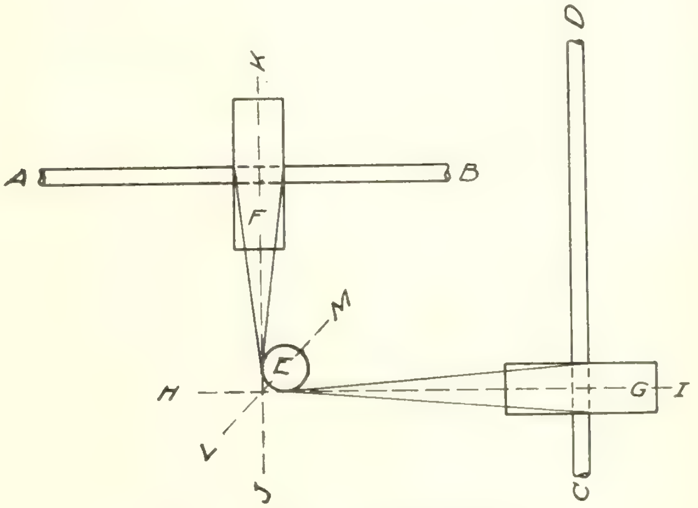


Fig. 5—Mule with adjustable idlers.

The main disadvantage with pulley coverings seems to be in keeping them on the pulleys.

An Artistic Plant Trellis

NOW that the end of winter is being heralded by many infallible signs, one's thoughts begin to turn to the garden and its contents, which, for some time, have been indistinguishable from the remainder of the landscape, and for that reason rather in the background of most people's mind. With the garden proper, there also recur the little borders around the house and fences, devoted to climbing plants to cover up otherwise bare spaces. As a variation from the familiar 1 in. by 6 in. board with saw cuts, run ¾ in. apart to within about 9 in. of one end, generally employed as a trellis for these plants, it may be worth while to mention a kind of wooden frame with a little more work in it, such as is illustrated herewith. This may be out of 1 in. by 4 in. or 1 in. by 6 in. according to the height. Divide the board into four equal parts—lengthwise and dado across at each mark. Then run two cuts into the board from one end about 1 in. from each edge, to within 7 in. or 8 in. of the other end, and one cut into the center of the board starting from the opposite end. Rip out some strips to fit the dadoes, and spread the various parts of the larger piece, securing them in place with the strips. Point or round such ends as desired, and the completed whole will somewhat resemble the illustration. For a higher trellis of course more crossing strips may be used, and to obtain a wider trellis all that is necessary is to use a wider board and put in more saw cuts alternately from each end as in the example given, in fact this idea is capable of great development by anyone blessed with a little originality.

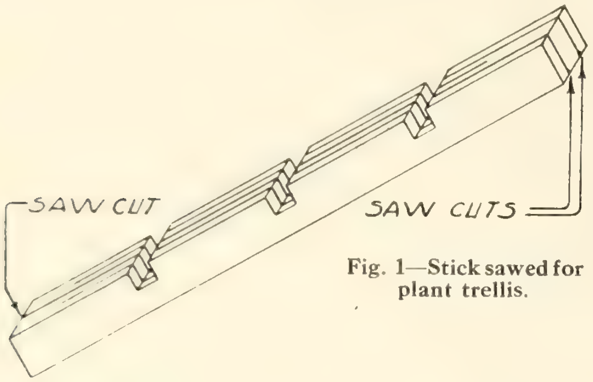


Fig. 1—Stick sawed for plant trellis.

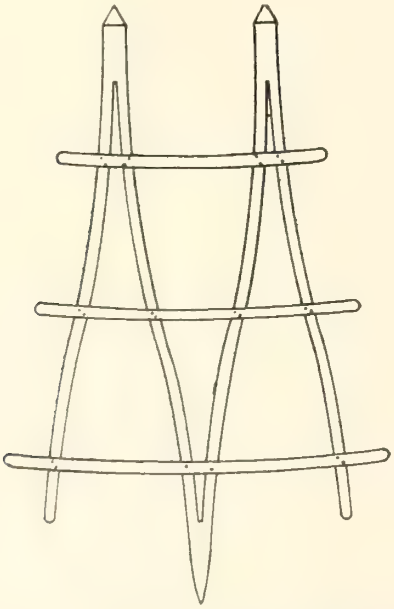


Fig. 2—Artistic plant trellis opened out.

Commendation of the Elliot Woodworker

The Elliot Woodworker, Limited, the well-known firm whose plant is located at the corner of College and Bathurst streets, Toronto, have recently made a change in the personnel of the company. Mr. A. A. Miller, who has been associated with the company for the past three years, is retiring, and is succeeded by Mr. G. M. Millar, who comes to the firm with a wide experience of the business. Mr. W. A. Elliot, who has been actively engaged in the management of the company since its inception, will continue as manager. The offices of the company have been removed from the Continental Life Building to the works at the corner of College and Bathurst streets where spacious and up-to-date accommodation has been provided and where in future all business in connection with the firm will be transacted.

The usual spring revival of trade has already made itself evident with the Elliot Woodworker, Limited, and the firm are very pleased with the business prospects. A number of orders have already been received and a great many enquiries have been dealt with. They are receiving a number of orders for different Woodworking machines manufactured by the company, including the No. 2 Woodworker (a cut of which appears on the inside page of the cover of this issue); the bench jointer, scroll saw and shaper, floor sander and surface sanders. No better proof of the merit possessed by the "Elliot Woodworker" can be afforded than a study of a testimonial which the firm received from Mr. James McDonald, foreman of Hudson Bros., builders, Toronto. Mr. McDonald has the following to say regarding the "Elliot Woodworker" machines:—"I cut 152 rafters plumb and foot; 58 joists, fire-cut both ends; 158 short attic studs; 80 collar ties; 300 bridging, ripped and mitred, in 7 hours; housed out 24 oak strings 10¾, 9 to 11 treads to string, in 6 hours; 32 Georgian pine strings, 14 treads to string, in less than 8 hours."

Mr. Elliot is at present engaged in perfecting a cheap Bench Boring machine which will meet a long-felt want. With this Boring machine the mortises for the door locks can be bored and also the holes for the nosing in stair string, besides all other kinds of boring.

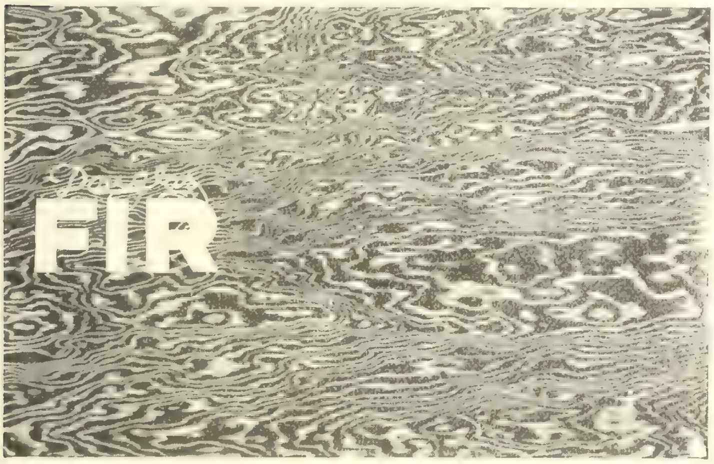
The firm enjoy a high reputation for enterprise, and also for reliability of manufacture in all goods turned out.

There is a great scarcity of elm for making cheese boxes, the price of which has risen very considerably within recent years. Only large logs are suitable to cut into veneers for these boxes, and a manufacturer of the boxes in the province of Quebec states there is great difficulty in securing supplies of good lumber. Elm seems the only wood suitable for this particular trade; others have been tried, but they have been found of little value, and much trouble has resulted from their use. It might be possible to secure supplies from other sources than Canada, but the cost is stated to be prohibitive.

Much of the so-called silk nowadays is made of wood. Germany produces more than one million pounds of this cellulose silk, worth $1,500,000. A ton of wood worth $10 yields cellulose worth $20, and this cellulose yields silk worth $850.

Utilization of Fir Veneer Panels

The Pacific Mutual Door Company, of Tacoma, U.S.A., is conducting a vigorous campaign in behalf of fir veneer panels. The Douglas fir veneers, an illustration of which accompanies this article, are turned from old growth fir logs, butt cut preferred, and run in width up to eight feet and in almost any length. Veneers are usually turned in thicknesses of either 1/6-in. or 1/7-in. They are marketed principally in the form of three-ply panels, finished ½-in. or 3/7-in. thick, as the case may be. These panels are made in all sizes up to 48-in. wide and 8 feet long. They are also made in two grades—one grade good both sides and one grade good one side. Two methods of drying are employed, one through the use of mechanical driers which dry the veneer in a few minutes; the other method is that of air drying, which process requires several days to accomplish.



Typical 3-ply fir veneer panel.

Veneer manufacturers are attempting to solve a number of problems created by the development during the past couple of years of fir veneer in the Pacific Northwest. In manufacturing veneers there is always a certain amount of low-grade, nutty, poor grained material which is unsuitable for doors or for wainscotting where the finest stock is demanded. All the low-grade stock cannot be utilized in the cores of the laminated panels, which are now turned out in considerable quantities by several veneer manufacturing plants. In sawing veneer from logs it has been discovered that a large portion of the inside of the log is unsuitable for veneer, being likely to contain nuts and other defects. Some of these logs being a foot or so in diameter what to do with them under the circumstances has been the problem. The low-grade stock is used principally for drawer purposes, desk backs, etc., the two-side panels being used largely for door purposes and the one-side panels for wainscotting and interior finish. The finished panels in the ½-in. thickness have a shipping weight of from 1200 to 1400 pounds per thousand feet surface measure. Fir veneers are manufactured only in the states of Oregon and Washington, but at the present time are finding a ready market in almost every part of the United States and Canada. On account of the beautiful figure of the grain in rotary cut veneers it is certain that this product will increase rapidly in popularity as its merits become known to the general public. Another commendable feature is its susceptibility to a very fine finish under transparent stains. Combining harmoniously as they do with yellow pine and oak trim these veneers for interior finish can be purchased at a reasonable price.

The Pacific Mutual Door Company has recently had prepared a large number of three-ply samples for distribution among interested dealers or possible users of such material. Another field which veneer manufacturers plan will consume a considerable quantity of veneer, both high and low grade, is that of the furniture factories. It has been found that the fir veneers make an excellent backing for mirrors, that they can be used in drawers as well as in many other pieces of furniture. Panels unsuitable for doors, wainscotting or other exposed surfaces, can be used in conjunction with these. As a result of the activity of fir veneer manufacturers in seeking new outlets for their product there has been considerable increase in the demand for such material, and manufacturers are confident that this demand will continue to increase. The Pacific Mutual Door Company is shipping its veneers to places as far apart as the Atlantic Coast on the east and the Gulf of Mexico on the south, as well as supplying a large demand in California, Chicago and the Mississippi Valley region.

Automatic Safety Device for Woodworking Machinery

A descriptive booklet which will undoubtedly be a valuable asset to employers interested in the welfare of themselves and their workers has been published by Bass Brothers of New York, N.Y., specialists in safety appliances for woodworking machinery. This guard for use over circular-saws is entirely automatic and self-adjustable. One of the features of this practical appliance lies in the fact that lumber, when passing through the saw, will automatically raise the guard and allow it to drop back into place over the blade when the work is completed. All unnecessary and clumsy attachments have been eliminated, thereby greatly reducing the mechanic's risk.

This automatic arrangement prevents neglect on the part of the workman which would be likely to result to his own detriment. Men with years of practical experience and study in the inherent danger of machinery suggest the remedy, and with the exercise of a little forethought, money will be saved, life conserved and efficiency promoted.

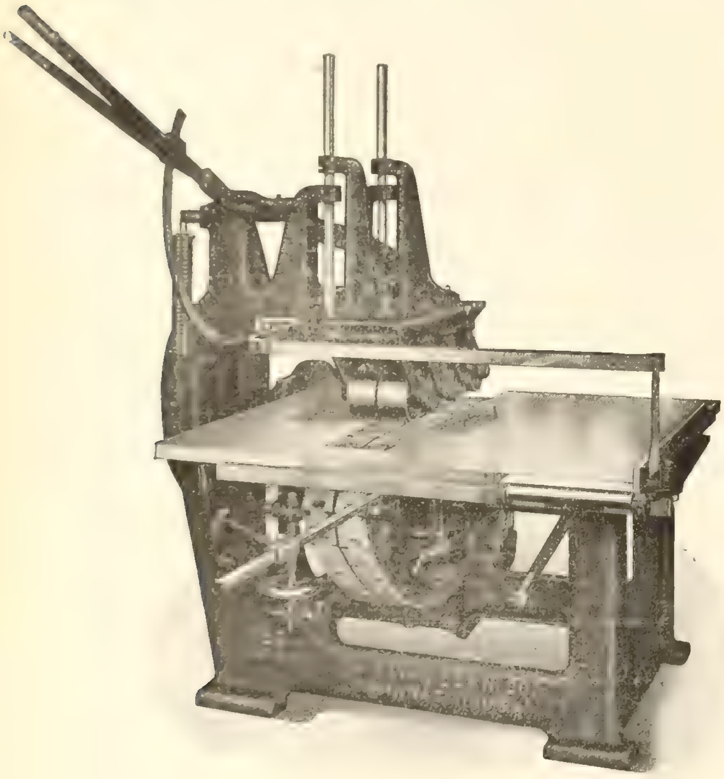
From time to time we are reminded of accidents which often result in fatalities brought about through unprotected machinery. Statistics compiled by leading insurance companies show that over 35,000 workmen are killed and more than 50,000 seriously injured yearly in the United States through industrial accidents. Of these it is claimed that more than fifty per cent. are due to mechanical appliances which have not been properly safeguarded. In view of these facts the practical appliances for woodworking machinery manufactured by Bass Brothers will be eagerly welcomed by all skilled mechanics in woodworking trades.

The Grand Rapids Hand Screw Company, Grand Rapids, Mich., has been incorporated with a paid in capital of $250.000. This firm has been in business since 1881. In its reorganization it has absorbed the business of the Michigan Cabinet Company, manufacturers of kitchen cabinets, the Bakorost Company, manufacturers of fireless cookers, and the Benedict Clamp Company, manufacturers of furniture clamps. It is the company's intention to discontinue the kitchen cabinet line and pay special attention to manual training equipment, laboratory furniture, domestic science furnishing, factory furnishings and special equipment for industrial institutions.

The capital stock of the J. C. McLaren Belting Company, Limited, Toronto, has been increased from $75,000 to $150,000.

New Machine for Edging, Ripping and Jointing Lumber

A new machine for edging, ripping and jointing lumber is now being presented to manufacturers of veneer tops and panels, kitchen cabinets, tables, caskets, cedar chests, piano cases, furniture and other work of this class. In one operation it will rip to width, make a perfectly straight edge and joint the board so that it can be glued up right from the saw, eliminating the extra handling and glue jointer operation cost and saving from ⅛-in. to ¼-in. of lumber on every joint as compared to other methods of ripping, edging and jointing. This machine saves enough in time and lumber to pay its first cost very quickly. It is claimed to be the greatest time, labor and lumber saver brought out in years and that it promises to supersede all other methods of utilizing short, narrow stock. When used in connection with a revolving clamp as much stock can be edged, jointed and glued up as by any other method, and will give you ten per cent. more lumber in addition. Upkeep cost will be practically nothing as there are no parts to wear out, break or grind, except the saw blade which can be kept in order by any filer, and the machine can be operated and cared for by any machine hand. The self-contained countershaft can be belted from any direction and direct-connected motor drive may be had if desired.



Edging and jointing machine made by Messrs. Fay & Egan Company.

With a 14-in. saw it will rip up to 3-in. thick and 32-in. between saw and fence. However, the table to the right can be extended to any length for building up panels or cores. The saw is mounted on a swinging frame beneath the table and is entirely enclosed in a cast-iron chute, ready for connection to exhaust system so that all sawdust and slivers are drawn down and away from the saw rather than scattered over the table or thrown into the operator's face as would happen if the saw were above.

The feeding is by two separate chains, one on each side of the saw, 3½ in. wide, interchangeable and removable. Chains run on long steel ways which are vertically adjustable to vary projection above the table for feeding rough and badly warped stock. Driving sprockets are eight-sided, cut from the solid and milled all over. Six feeding speeds are provided, ranging from 18 ft. to 125 ft. per minute. All gears are cut from the solid and entirely enclosed. Four double idle rolls, 6-in. x 3½-in. are provided one above each chain, to give pressure. Each pair has independent adjustable spring pressure, and as these rolls are hung on an angle there is no jar when the board goes under them. The entire roll housing is quickly and easily raised without disturbing the set of the rolls, by means of a self-locking lever and spring counter balance.

All interested in this new machine will be sent detail description and price on application to the J. A. Fay & Egan Company, 153-173 W. Front Street, Cincinnati, Ohio.

The Bettschen-Higgins Company, Limited, have been incorporated a limited company, with a capital of $50,000, as manufacturers of store and office fittings, cabinets and show cases, mill and factory work, etc. The new company are successors to the Bettschen-Higgins Company of Vancouver, B.C.

Plans are in progress for the building of a furniture frame factory at Stratford, Ont. Mr. Charles Diebel is the owner and the architect is Mr. Thos. Hepburn. An upholstering factory is also to be erected shortly at Stratford for Mr. John S. Morelock. Both factories will be mill construction.

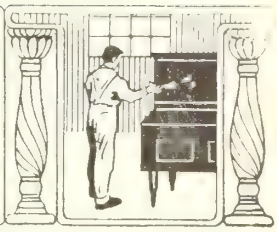
A new company has been incorporated with head office at Uxbridge, Ont., for the manufacture of pianos, organs and other musical instruments, piano stools, benches and musical cabinets; and to carry on the business of wood carving, cabinet making, etc. The trading title of the firm will be the Uxbridge Piano Company, Limited.

The eastern planing mill of the R. Laidlaw Lumber Company's plant was totally destroyed by fire on the night of March 16, the damage being estimated at $40,000. Recently the mill, which was of brick exterior and wood interior, was equipped with a number of valuable woodworking machines, and the building also contained a large quantity of valuable interior furnishings. The plant is to be rebuilt at once.

Building operations in a general scheme of development of the Canada Furniture Manufacturer's plant will proceed on a large scale in Woodstock this season. Material is being delivered on the ground for a four-storey factory addition, 100 x 60 feet, to be built as an addition to the present buildings and to be used for manufacturing purposes. The new structure will entail an expenditure of about $15,000. This will represent only a portion of the money to be spent on the factory improvements this year.

Plans for the reorganization of the Canada Furniture Manufacturers Limited, outlined at a meeting in Toronto on March 9, involve the sale of the company's undertakings and assets to a new company which will be capitalized at $2,000,000 preferred stock, $1,000,000 common stock and have an issue of $1,000,000 6 per cent. debenture stock. Canada Furniture Manufacturers, Limited, was organized in 1891. The company has an authorized capital of $2,000,000 in preferred 7 per cent, cumulative preferred stock and $1,000,000 in common stock.

THE FINISHING ROOM



Formulas and Methods used in Wood Finishes

Contributed by Walter K. Schmidt

THE two oaks that predominate are golden and fumed. They present two distinct styles of finishes, the glossy and the dull. Although some golden oak is turned out in a dull finish, generally it never appears in a wax finish, because the latter finish on golden oak does not carry out the general intent. Golden oak is said to be one of the easiest finishes to make, which is true, because it goes on all classes of furniture, high grade and the cheaper grades. The different conceptions of a golden oak as a finish can be readily seen by taking a walk through the furniture stores. When you ask a salesman why he calls them all "golden oak," you wonder why he doesn't blush when making the statement.

One of the most common ways of producing this popular shade is by the use of golden oak filler. This is usually supplied in paste form, the color being incorporated in the filler. A method I recommend, and one employed by many of our best manufacturers, is as follows: take oil black 3½ parts, oil yellow 1½ parts, oil brown of a reddish cast ½ part. Of this mixture, weigh out four ounces and dissolve in a quart of turpentine. This can readily be done by heating the turpentine on a water bath. When the color is thoroughly dissolved add to it one-half gallon of turpentine asphaltum. Stir thoroughly, and to this mixture add one gallon of naphtha. This will give you a strong, penetrating oil stain which does not raise the grain. Prepare the filler in the following manner: to a high-grade quality of silex, which can be purchased very cheaply in barrel lots, add Japan and boiled linseed oil in equal parts to make a paste. Then lengthen the paste with naphtha when ready to use. The stain coat which has been given from fifteen to twenty minutes to dry, will give a dark brown appearance to the work. Anyone familiar with asphaltum varnish can imagine how the work will look.

Applying the filler coat, rubbing well across the grain will take up the excess stain. Color the filler during the process, thoroughly fill the pores, and the peculiar consistency of the stain makes the filler dry like adamantine in the pores. When the work is cleaned ready for the shellac coat, it will be found that the flake presents that rich color with its lighter yellow gradation. It will have a transparent and not a muddy look, contrary to the appearance given by the use of asphaltum only. There is no difficulty about the filler coat as it is strictly composed of silex.

The shellac usually employed is white shellac. Where a tint of orange is desired, orange shellac may be used. The rest of the finish is usually governed by the price of the article. Whether it is high grade or cheap furniture, no better or more economical stain or method of procedure can be employed.

In these days we hear a lot about efficiency, manufacturing economies, cost of production, etc., many of these articles being written by theorists who have never practiced that which they preach. For this reason I wish to say that the formula and methods given above were put to practical test in three different institutions making three different grades of furniture. The last one was in a factory manufacturing children's sleds. The sleds were dipped bodily into this stain which, however, had to be thinned considerably. Fumed oak, which is still gaining prestige and popularity, is not so easily handled. The results depend more upon the growth of the oak, and whether red or white, the original tint of the wood, through its chemical constituents, goes a long way to help in producing the color of the finish as will be seen in a method I am about to describe. Fumed oak, as its name implies, is supposedly wood that has been subjected to a fume. Ammonia in its gaseous state is the fume, or rather the chemical that produces the changing color of the wood. It is its action upon the tannic acid, and possibly other similar components that make the shade.

One thing, however, that we lose sight of is the fact that in the olden times when the finish was produced in this way the color was augmented by the use of linseed oil, of which repeated coats were given and then rubbed to a polish. The penetrating of the oil, after the wood had been subjected to the ammoniacal vapors which are strictly alkaline, and which naturally leave the wood in what we might term a dead appearance, were thus received by the use of the oils, helping to give a depth of color by causing the outer fibres to have a more or less transparent effect.

The fuming box is being gradually installed because it is really the best method for producing fumed oak. To enter into the details of the fuming process would mean considerable time and space. Very good fumed oak, so called, can be produced by the aid of chemicals, some aniline dyes assisting. One process that is worthy of the manufacturer's consideration, and one that will give a permanent color which few can detect from the genuine fumed, is the bichromate process, which penetrates the wood so that even the edges which are usually first to show the wear will stand up. The wood is coated with an alkaline solution of bichromate of potash, usually in equal parts, an ounce of each to the gallon of water. This stain must stand twenty-four hours, and then sand. It takes about a day for this mixture to produce its effect, advantage being taken of the change in color which takes place in the bichromate when exposed to atmosphere and light. The reason the alkaline is added is to cause penetration and the browning of the hard part of the flake.

The second coat consists of a brown stain, it does not matter how made. Some use acid brown, walnut brown, or a brown made by mixing orange and black until the desired shade is produced. At any rate care should be taken that only acid colors are employed, nor should the final color be judged until a thin coat shellac has been applied. Any shade of fumed oak can be matched by this method. It may be necessary to add Nigrosine black to the brown in order to strengthen and get away from the yellow. As the first coat is supposed to act upon the amount present, this amount governs the color. Therefore, the second coat must be graded accordingly. Wherever the cost of production will warrant, I strongly recommend an oil coat on top of the first coat. One part of boiled oak to three or four parts of naphtha will work wonders. Usually this coat will dry overnight, but little grease spots are left. If wiped off with rags the second coat will hold and the result will be a much more transparent color.

To the manufacturer who has established a good working formula out of the above recommendations, and who has various shades of fumed oaks to match, let me say: don't change your formula but match the "other fellow's" tint by using colors in the shellac coat. The groundwork of fumed oak, no matter how produced, is very much alike, and when you have a piece to match, try the following method before you change your general formula. Dissolve one-half ounce of Bismark brown in a piint of alcohol, and to it add a pint of white shellac. In another pint of alcohol dissolve a half-ounce of spirit black, and to this add a pint of white shellac. You will now have two solutions, a red and a black, the peculiarities of which are such that almost any shade and tone of brown can be produced, which when added to the shellac coat will make possible the tinting of the fumed oak to match a great many of the shades now on the market.

It will help the finisher by this method to doctor spots and light pieces to bring out that general uniformity so desirable in fumed oak. As I have said already a good deal of the color depends upon the original constituents of the wood, all of which may not be noticed until the piece is nearing completion. The above then comes to the rescue with the result that a satisfactory finish is produced.

The Practical Character of Wood Stains*

By Charles Harrison

IN my opinion the following are essential properties inherent to a good stain, and I give place to the following: first, the material must be in a state of solution, i.e., free from suspended or partially suspended matter; second, the stain should contain little or no colloidal substance, more particularly of the character of glue, size, gum, starch, etc.; third, the stain may or may not undergo any change after application, but if a change be intended it should take place at the time or immediately after being applied, but such change must be final.

I will content myself with merely pointing out three salient properties; without doubt there are more.

Salts Known to the Polisher

Now, by way of illustration of the three conditions advanced by me, I make mention of perhaps one of the most familiar chemical salts known to the French polmate. The salt dissolves in water, hence forms a solution; such solution, when properly prepared, is free from suspended matter. Again the solution is practically free of colloids. It is therefore easily seen that the first and second propositions which I have advanced have been fairly complied with. I now turn to the third. It will be generally agreed that when the stain in question is applied to mahogany of a kind well known to the trade, a change occurs, the mahogany becoming deeper in tone.

Now the precise action of the stain upon this particular wood is somewhat obscure, but from ideas derived through observation on my part, there are strong grounds for the assumption that it is not entirely the stain which creates the change of tone, but rather, in turn, such change is dependent upon the amount of effort the wood itself can exert upon the bichromate salt. A sort of what the chemist would call mutual decomposition takes place. This statement, if not entirely, is certainly partially, borne out by an experiment. It is well known to chemists that if a solution of potassium dichromate be treated with organic matter, reduction of the salt in question takes place with a corresponding amount of oxidation of such organic matter.

I therefore take a solution of bichromate, add a little cream of tartar, or if that were not to hand, I would take some starch or gum, etc. On warming somewhat a change to a sort of olive-green color is easily seen, due to the decomposition of the chrome salt, likewise the cream of tartar. I have performed this experiment, not with the object of trying to prove the chemist right or wrong, but rather to better impress my audience with the admissibility of the idea of a mutual decomposition, also with the fact that when reduction takes place, oxidation also results. Let me next point out, before we dismiss the subject, that the magnitude of reduction and oxidation are dependent, as it were, on the power or fighting strength of the dual forces.

Nature of Bichromate

Returning to my third proposition, from which I may appear to have digressed. From the statement I have just made, I am confident it will be quite an easy matter for every one to grasp the full signficance of its nature, also at the same time to sum up the character of the bichromate, thus ascertaining in what manner, if any, it is wanting in order to fulfill the quoted specification. We now find that the stain undergoes a change on or immediately after application, and that such change is intentional. But is this change absolute or final? This, I feel convinced, is not the case, and my reasoning for such a statement is based on the well-known property possessed by bichromate of acting as a bleach or oxidizing agent. Thus, bichromate, which so readily imparts tone or color to mahogany, eventually turns tail, and assists in its destruction.

Bleaching of Mahogany Finish

Many are painfully aware of the fact that beautifully colored mahogany is reduced to a kind of ashy-gray color, especially on outside work, particularly in situations with a south aspect. All that is necessary to establish such result is to allow the polish to become perished with unconverted bichromate present, such, in conjunction with the elements, finally produces a color that but few polishers will stop to admire.

---

*From an address delivered to cabinet-makers in London, Eng.

While on the subject of fading I am reminded of the fact that there is a section of the trade who are clamoring for an easy and simple method for converting new mahogany into a kind of faded-out appearance. I think from what I have just stated, a means of obtaining this end would be found by simply treating the work with the stain, afterwards submitting it to ordinary atmospheric conditions. Work oiled over after staining would not seriously interfere with bleaching action; anyway, that is my opinion. Hitherto I have not been so far interested as to submit wood to a test of this kind. Possibly some may have done so. If this method has not been tried, then it still remains for someone to give it a trial.

At the risk of appearing superfluous I may venture to give a more extended account of the nature of bichromate, for it is my intention to introduce to your notice other kinds to that which is generally used by the furnishing trade, confining myself, as far as I know how, to simple phraseology, since it is more than likely that this paper may be published in trade journals not usually devoted to topics of chemical technology or applied chemistry. I have, therefore, not only the interest of my audience, but the intelligent general reader to bear in mind.

Bichromate of potash, it will be seen, is a compound of two metals, potassium and chromium, in the proportion of one equivalent of potassium to two equivalents of chromic acid; this salt is therefore inorganic. It should be understood that a chemical salt is a union of a base and an acid radicle. That which chemists call a base may be likened to that substance which, when dissolved, say, in water, its solution is found to impart a sort of soapy taste, such as is represented by potash in bichromate. While, on the other hand, the acid may resemble that which imparts a sour or vinegary taste, represented in this instance by chromic acid. Generally there are three types of salts termed by chemists neutral or normal, basic and acid. Normal may be represented to consist of equal equivalents of base and acid, basic two equivalents of base and one of acid, acid salts one equivalent of base to two of acid. It will now be seen that bichromate belongs to this latter class of salts.

From these remarks one can now more easily appreciate the chemists' term, previously quoted, "potassium dichromate." The salt crystallizes in large red transparent anhydrous four-sided tables. It is soluble in the proportion of about one part to twelve parts of water at a temperature of 60 degrees Fahrenheit, the color of the salt being due to the presence of the acid forming oxide of chromium.

Salts Not Very Well Known

Here let me state that chromic acid not only combines with potassium to form bichromate, but such other bases as sodium, ammonium, etc., giving rise to such analogous salts as sodium and ammonium dichromate. These salts, however, do not appear to be particularly well known to the French polisher. For example, I have been connected with the trade for nearly thirty years, and have never even heard a polisher mention them; neither, of course, have they been called for.

For the purpose of showing you whether such are utilizable, and with what results, I have coated five kinds of mahogany, notably, Cuban, Honduras, American, African and Spanish; each board shows three patches of stain, one produced by potash dichromate, the other two being sodium and ammonium dichromate respectively. The stain of that from the ammonium salt is particularly striking for the depth of color produced. The color obtained from the sodium salt is also characteristic, but whatever its character may be there are strong grounds for not adopting it too readily, since this salt is particularly deliquescent.

I have these salts upon the table. The sodium salt has been purposely placed in this basin previously to the meeting, and although fairly dry when placed there, it now contains some liquid material. This liability to liquefacton leads me to caution you not to adopt it without due trial, since it is, in my opinion, very likely to destroy the superimposed shellac coating.

Experiments on Materials

I want to return to the ammonium salt for a moment, in order to show you a rather striking, perhaps an amusing experiment. On causing a little of the salt contained in this iron dish to be slightly heated, it is seen that the red salt is readily decomposed, with evolution of heat, to a dark green powder—green oxide of chromium. One is now enabled to sum up truly in a limited fashion a few important individual characteristics existing between these chromic salts. Potassium dichromate is a fairly stable one, since it is neither deliquescent, nor is it decomposed by moderate heating. Any one who has paid attention to what I have stated will be in a position to distinguish for himself between either of these three salts if ever there be a need to do so.

I feel it will be of some interest to give a few remarks about chromic acid. This acid comes about by the oxidation of the metal chromium; such being the case, two oxides have been clearly brought to your notice, notably the green oxide just produced, and now this sample of red acid crystals which I hold before you. Here one may become a little perplexed as to why both should be oxides.

Allow me to direct your attention, as it were, both ways—left and right. Let me say, on my left is the green oxide powder, on the right crystalline oxide, which is acid. Let me repeat both are oxides. The green is produced by reduction of the red, and the red can be produced by oxidation of the green. Green, then, is the lower oxide. Now a sharp imaginary line may be drawn between each, since the green may act as a base to strong acids, such as sulphuric acid, etc.—such combinations giving rise to chrome alum—producing a series of salts whose solutions show a green color. On the other hand, the higher or red oxide forms an acid to a strong base, as potash. It will now be understood that the red color present in bichromate is due to this particular oxide of chromium.

I would not have troubled you with these remarks but for the fact that in the action of staining with bichromate, the rich color produced is no doubt due to a partial reduction of the chromic acid to some compound lying between the red and the green, or it may be a mixture of both, that is, red and green.

An Important Factor

Looking in another direction, the green quoted is, or may prove to be, a very important factor to the trade and by the trade I mean those who are so extremely busy creating copies of the old masters — forgeries is a description I have heard for them. Now it may not be generally known that the existence of chromium is said to have been discovered by one named Vauquelin, in the year 1797; it therefore must

D. H. R. Enamels

Trade reports show increased popularity and demand for enameled furniture, especially in the Adam style in bedroom furniture; our Colonial or Antique Ivory gives a very rich and beautiful finish that wears well and appeals to the most critical buyer.

Cameo Undercoat and Samurai Cabinet Enamel

Are made for spray as well as brush work and aside from an established reputation of many years have the following advantages:

Requires less air pressure,

Covers better with greater reduction,

Flows out and does not show pit marks,

Less exhaust to carry off vapor,

Using less air, reduces waste to a minimum,

Flows out, saving time in sanding.

If your line can be finished by spraying it will pay you to use the D. H. R. Process.

In White and Colors. Air Drying and Baking.

Denny, Hilborn & Rosenbach
PHILADELPHIA, PA.

follow that if chromium was not discovered until the year quoted, work made previous to that period could not have been stained with bichromate. There is also a great probability that this stain was not applied until some years after its discovery, but when, I am unable to state.

Now comes the turn of the antiques. I am no authority; but if Sheraton, Adam and Chippendale periods existed prior to the year 1797, then it is safe to state that fraudulent goods will be rendered easy of detection where they have been stained with bichromate. The detection to me, at any rate, seems quite simple. Scrape the surface down to wood, collect all scrapings, incinerate, cleanse the resulting ash, and the residue will be green chromium oxide.

It will be remembered at the outset that I indicated indifference to the science underlying the polisher's art. It will be a sorry plight for manufacturers or dealers of antiques, which are supposed to be of a period previous to 1797, if they eventually reveal presence of chromium, for are there not the chances of a judge settling the price to be paid for their indifference in the past in regard to the staining operation of goods of the nature described?

Stock that has been carefully finished at the planer should be protected from dust and dirt, for dust is harder to clean off with sandpaper than a little roughness in the dressing.

There are several ways of brazing saws, but into none of them would recklessness or indifference be allowed to enter. A good job means careful and painstaking attention, no matter what methods are followed.

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

Oil Soluble Stain Powders

Try our latest and best production.

A perfectly Oil Soluble

Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Walter K. Schmidt Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

The Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipe

WHAT IT CONTAINS

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
Nicholls Building, Toronto

"50"
FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and **does not show brush marks.**

R. C. Jamieson & Co., Ltd.
Established 1858
Montreal Vancouver

Owning and operating P. D. Dods & Co., Limited

OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

The Manufacture of Wood Flour

THIS subject is reported upon by U. S. Consul Skinner, of Hamburg, Germany, from whose remarks the following extract is culled: Little wood flour is made in America, but inquiries are frequent concerning it, and this indicates that interest in the subject is general. Norway, Sweden, and Germany are the principal sources of supply, and it has been generally reported that the most approved material is spruce, and that sawdust is used, and that the machinery for reducing the sawdust to flour consists of a pair of old-fashioned millstones, such as country mills employ in grinding corn meal. It appears from a report recently made on the subject by Consul Robert P. Skinner, Hamburg, Germany, that considerable misunderstanding has existed regarding the manufacture of this commodity. A summary of Mr. Skinner's report follows:

Norwegian flour contains more resin than German flour, the latter being produced from the waste cuttings by toy and wooden-shoe manufacturers. It has been stated that large quantities of sawdust of clean white northern ash are available in the United States for the manufacture of wood flour, and further details in regard to German mechanical processes have been asked for.

According to German experience hardwood is the best material for the production of high-grade flour, such as linoleum manufacturers require, and this is turned out by machines, some of which are recommended as rendering equally effective service with roots, branches, boughs, sticks, tender shrubbery, slabs and wood waste of every kind. Reducing machinery of this character is used in preparing raw material for a good many chemical and other industries.

The ordinary process of producing wood flour in Germany consists of feeding the material into a revolving iron cross beater. The material should be not larger than one-half to three-fourths of the length of a finger, and it is beaten to the desired fineness as sawdust, in which is contained a large percentage of exceedingly fine meal. The capacity of the machine depends upon the fineness sought and the quality of the wood, brittle wood yielding a finer flour and a greater quantity per hour than any other. When it is desired to obtain a meal finer than sawdust a rasping mill is employed. These rasping mills have an interior construction similar to that of the iron cross beater, a rasping risk revolving against the inner walls of the apparatus, the metal plates of which present rasping surfaces. Light material fed into this machine to be ground cannot be ejected until it is perfectly ground, whereas in the machine first mentioned the iron cross beater merely revolves in the wood debris. When the output of flour sought is inconsiderable and time does not press, both an iron cross beater and the rasping apparatus can be utilized in the same machine.

The rasping mill turns out a product of a sieve fineness of No. 25 European. It contains a larger proportion of exceedingly fine meal than that produced by a beating cross. If still finer flour is desired than the rasping mill furnishes, the product of the rasping mill can be passed through a spiral-screw sifting machine. In these mechanical sifters the material passes through a hopper to spiral brushes, which transfer it continually to the face of the sieve, finally expelling the coarser quantities at the discharge hole. This coarse overflow can be returned to the rasping machine to be reworked, although usually the factories employ the coarse meal as it comes from the sieves.

Pieces of wood larger than one-half or three-fourths of a finger length should be crushed before being fed into the iron cross beater. If the material contains resin and a certain fineness is desired the resin must be removed by other machinery, which is fairly expensive.

There is a brisk trade in wood flour in Germany, both for domestic use and for export. The most recent statistics include imports and exports of wood flour and excelsior under one head and are as follows: Imports, 1911, 5,192 metric tons, and 1912, 5,318.9 tons; exports, 1911, 7,213.5 tons, and 1912, 9,851.9 tons. Of the exports 703.8 tons in 1911 and 1,401.1 tons in 1912 went to France and 1,897.7 tons in 1911 and 2,295.2 tons in 1912 to Great Britain.

The Problem of Making Moulding Knives

THERE are many ways of solving the problem of making moulding knives so as to cut a given moulding. Most of these, however, are found to be too complicated for the average mechanic to figure out, when he follows the usual shop methods of sending the detailed drawings to the Sticker or Shaper hand, who makes the knives. For almost any problem a satisfactory solution can be found. The following problem, so simple and yet so practical, can be adopted by any mechanic however unskilled in scientific drawing he may be:—

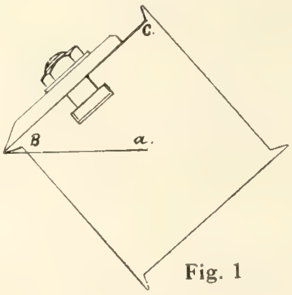


Fig. 1

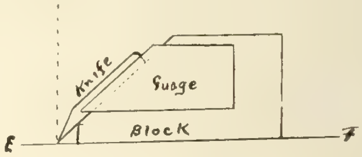


Fig. 2

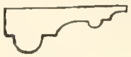


Fig. 3

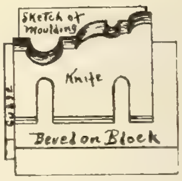


Fig. 4

Make drawing of end view of moulder head as shown in Fig. 1. Draw line from clearance of lip to centre of head (a. b.). Take a square block of wood as shown in Fig. 2 and bevel one end so as to form angle a. b. c. in Fig. 1. Nail a thin board on one side to project past bevel of block to be used as gauge to keep the knife straight. Rough out the knife and place on bevel edge of block, keeping edge tight to gauge. Place the block on the detail drawing e, f, allowing the knife to touch the lines of moulding as in Fig. 3. Look perpendicularly on drawing, and grind to fit moulding as in Fig. 4.

In the desire to save the time and expense of a man to go through the plant and oil the different journals two or three times a day, by installing grease cups and other devices, one should not overlook the fact that a certain amount of regular inspection is necessary, anyway, lest something go wrong that will cost a whole lot more than the time of the man going through the place occasionally.

Veneers and Panels

Veneer Practice in the Manufacture of Commercial Furniture

In a plant such as that of Messrs. Jones Brothers & Company, at Dundas, Ont., the largest of its kind in the country, the methods practised in the various departments represent, collectively, the greater proportion of the success of the whole enterprise, and individually important elements in that success. If, then, we give our readers a few points from observations that a representative of the Canadian Woodworker made upon a recent visit to this plant, undertaken in the interest of the veneer section of our readers, we shall be discussing an important department in what is regarded as one of the most successful woodworking industries in Canada.

To commence with, the veneers used in this factory are all manufactured outside, and of necessity, therefore, the company have to carry a considerable stock to meet the varied demands of their orders. A special stock room under the veneering shop is devoted to veneers. The floor of this room is just the bare earth. The piles of loose veneers and crates, still unopened, are carried on bearers so that there is a good air-space under the piles. The object of having a stock room with an earth floor is to ensure that the air will be kept moist, since dry air is one of the worst enemies of veneers while stored before use. Dry air causes the veneers to crack even while in the pile and in any case renders them too brittle to handle with ease when getting ready to glue. Practically all the finer varieties of veneers are represented in this room, including Circassian walnut, French burl walnut, figured and plain mahogany, curly birch, bird's eye maple, and quartered oak.

There is also a quantity of 3-ply stock for use in drawer bottoms, etc., as the firm makes chiefly 5-ply panels in their own plant. Most of the fine face veneers are slice cut, except the quartered oak, which is preferred sawn, since the slicing method is inclined to break up the brittle part of the grain. For cross-branding in 5-ply panels rotary cut birch, gum, and poplar are mostly used.

Following the general practice of the present day, wormy chestnut finds chief use as material for cores, a continuous feed glue jointer being located next the veneer room to joint this core stock. Any veneers found to be so buckled as to be likely to cause air pockets in gluing up are previously shrunk and flattened between heated cauls. Speaking of cauls, it may be mentioned that this is one of the places where the zinc caul is being replaced by aluminium, especially for the large panels. As the aluminium is so much lighter it is possible to materially increase the thickness of the caul without making it heavier than one of thin zinc. The thicker caul holds the heat better, and this is reflected in uniformly better setting of the glue.

Where veneers have to be jointed up to make the required width, they are tacked down with all joints closed, and tape is glued over the joints. This holds the joints tight while the veneer is being glued up with the panel. After the tape is sanded off, the joint is hard to detect, unless there is a considerable difference in the figure of the two pieces. The matching of figure where joints occur is not a very difficult matter, since all sliced or sawn veneers are always sold and shipped just as they come off the log; so that all that is necessary is to keep each piece next its neighbor in the bunch.

Particularly in the case of Circassian walnut, any veneer that shows a distinct figure is often made up into a panel with a joint across the panel both ways, dividing it into four matched quarters. In sorting veneers for this work, four pieces are taken together off the pile and opened out sideways, two on each side. Then each of these pairs is again unfolded, this time end-ways, giving the relative positions of each piece ready for jointing. Crotch mahogany, French burl walnut, and other woods of similar figure are treated in this way to obtain some very fine effects in panels.

For large veneered panels this plant uses hand screw presses of the unit type, the number of units employed depending on the length of the panel.

Small panels are piled between wooden clamps in a power press, when full pressure is applied. The clamps are bolted together, so that the whole pile may be taken out of the press and allowed to set under pressure without hindering the use of the press. All veneered stock is piled with strips between each piece and a weight on top of the pile for some time before leaving the veneer department for trimming and sanding. This allows the panels to dry evenly on both sides without warping.

The glue is heated in a copper kettle with steam heated water jacket and rotary agitator.

The manufacture of commercial furniture calls for the veneering of quite a number of curved surfaces, even down to the covering of small columns with quartered oak. The forms used for this work are of sheet zinc. A wooden frame, with just room between the sides to admit the column, has a piece of zinc secured to the sides. This zinc is allowed to form a trough, and when a column is clamped between two of them the zinc adjusts itself exactly to the shape and ensures that all parts of the veneer will be tightly glued. The bases of some types of show cases, which are made with a moulded face, are veneered in the same way. In this case the back of the wood is also given a coat of glue, to counteract the warping effect of the glue on the face drying and contracting.

Cores for doors of which the edges are to show are glued up first in the ordinary way out of chestnut and then sawn to size. A one-inch strip of the finish wood is glued on the edges which are to show. The face veneer is put on over all and no core stock is visible at all.

It is unfortunate that some people get a mistaken

Main factory building at the plant of Messrs. Jones Brothers & Company, Dundas, Ont.

idea of veneer work and regard it as more or less of a fake. There is nothing cheap about veneer work, and it is doubtful if it would be possible to find an instance of veneered work being sold as solid. At the present time veneered furniture is the most sought after and the highest priced. It is possible to obtain much more beautiful effects with veneers than with solid wood, not only on account of the peculiar facilities for working afforded with veneers, but also because in these days the best of the woods are made into veneer. And, lastly, it is universally admitted that a veneered panel is stronger than a solid one.

A detailed description of the whole plant of Messrs. Jones Brothers & Company, Limited, was published in the March, 1913, issue of this journal, but it may be of interest to state here briefly that the company's head office is in Toronto, where they have a branch factory, and that the firm have branches in Montreal, Ottawa, Winnipeg, Saskatoon, Regina, Calgary and Edmonton. The President is Mr. Sidney Jones, the General Manager, Mr. R. J. W. Barker, and the Secretary-Treasurer, Mr. H. S. Garlick. The superintendent of the factory at Dundas, Ont., is Mr. Halberstadt.

European and American Veneer Manufacturing Methods Compared

IN a comparison of the methods practised in American and European veneer and panel manufacturing plants Mr. J. B. Stryker, of the Perkins Glue Company, Lansdale, Pa., comments most favorably upon the appearance of the finished product as turned out by the plants of the old countries. While naturally this branch of woodworking dates back much farther in Europe than in America, Mr. Stryker states that America leads Europe in the number of plants in operation, the amount of output and the general magnitude of the business. In France veneering has been done for hundreds of years, but, instead of being carried on as they are now learning to do it, it was done in a very small way indeed. Where veneered lumber was desired, the small cabinet maker would cut his own veneer; the product he then obtained should be more properly called by the name of thin lumber. Two men were employed in the operation, the log being placed with each end on a high saw-horse or platform, and the veneer sawed off by hand, one man under the log and one above, pulling the saw up and down much after the fashion in which two-man cross-cut saws are operated in our timber camps to-day. This method may even yet be seen in use in remote localities over there.

"As evidence that the American manufacturer is in advance of the manufacturers of Europe," says Mr. Stryker, "I would cite the fact that in the largest and most progressive plants over there machinery of American design and manufacture is in evidence almost everywhere—veneer lathes and appliances, trimmers, dryers, taping machines, glueing appliances, sanders, scrapers and much machinery of a kindred nature. The hydraulic press has heretofore been used to a less extent over there than it is here, but they are now adopting it as time goes on, and those of American make seem to again have the preference. Furthermore, in many instances where machines are not American-made, they are such a good imitation that it seemed to me they were modeled as closely after our own as it was possible to make them.

"Naturally with so much American-made machinery and appliances in use in their plants their methods must rather closely conform to our own. During the

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB Reg U S Pat Off

Hoffman Bros. Co.

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS,

1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—SPECIALTY—

Indiana Quartered Oak

Sawed Quartered Oak Veneers

WHITE OR RED — HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

past few years I have known of numerous instances where the Europeans have come to us for ideas and methods, but I believe it is a rare thing for us to go to them with the same object in view. Although American-made or modelled machinery is employed so largely by them, the production of the average plant, comparable with ours as to size, equipment and number of men employed, falls considerably short of the production turned out over here. In addition to veneer and panel plants, I visited several factories engaged in quite different lines of manufacture, and my impression gained thereby was that the American manufacturer, given an equal investment of capital, will generally turn out a considerably larger production. The European manufacturer, regardless of the particular line of work in which he is engaged, is very apt to give more attention to details, and there is more time spent on details than usually prevails in the average American plant.

Secret of Superior Finishes

"They prepare their logs much as we do, usually boiling or steaming them. The cutting of the veneer is the same, as is the subsequent drying also. In Austria-Hungary and Germany the alder is largely used for core stock. Five-ply work is usually laid up in the same manner as here, but in Vienna, which in Austria is considered as the home of fine furniture (and some beautiful work they certainly turn out), I saw Circassian and mahogany tops laid up three-ply, the veneers being laid on three-fourths-inch or seven-eighths-inch alder cores, sometimes with the grain and sometimes across the grain. I believe that the American manufacturer usually considers that high-class work of this nature can be done only by the use of cross-banding. I should say that the preparation of the veneer and the building up of same into panels, tops, etc., in the white, was no better than here, but the finish they put on their work in many cases excels ours. Labor being cheaper, they can afford to spend more time on this part of their operation. As one Austrian long in the business expressed it to me, 'It takes the human touch to get the right finish.' While I am unfamiliar with the materials generally used for finishing purposes, both here and abroad, I understand that at some points in the finishing process they use materials little, if ever, used in this country. The deep appearing finish which they obtain, I consider, is very pleasing to the eye. Beech is used largely in France in the making of panels, as it is a comparatively cheap wood in that country. To-day three-eighths-inch veneered panels are in demand there for use in places where they before have been in the habit of using thin, solid lumber, so much trouble was encountered with the latter on account of splitting.

"In Germany, quite a business is maintained in the manufacture and sale of "wood plates," as they call them. These are made up three, five and seven-ply, being about there-fourths, one and one-fourth and one and three-fourths inches thick, respectively. These are made up to as large as six by twelve feet and sold for various uses, such as beds of printing presses, billiard tables, etc. The large sized plates are oftentimes bought by the users without regard to the particular purpose for which they are to be used, and they are then cut up into different sizes as required.

"In London there is a panel factory which struck me as being unique. In this plant there is not a single power driven machine, the reason being that there is a law prohibiting the use of any power driven machinery in the district in which the factory is located. In making panels they place the center stock on the floor and the glue is applied by hand with a large brush. This plant presented an instance of modern and obsolete equipment in that it had several hydraulic presses which were worked by a hand pump, while, on the other hand, the glue was kept in condition by placing the bucket in which it was contained over a gas flame. The method of handling resulted in a great deal of blistered work, which was repaired by placing a wet-cloth over the blistered portion and then running a hot flat-iron over the wet cloth until the veneer was stuck down.

"In Germany, I saw a veneer clipper, a description of which may be of interest. It is built along the lines of an ordinary veneer clipper, but it is very much more powerful than those ordinarily used in America. The knife comes down very slowly on an angle of somewhat less than forty-five degrees. This machine clips the ends off from a whole flitch of sliced veneers at one time and leaves so clean a cut that the ends can be spliced into a perfect joint. It is used for cutting the veneers to proper length and width, and also for jointing veneers ready to splice. The splicing is done by young girls who tack the edges of the veneer to a board and then stick a strip of gauze tape over the joint. On the tops turned out by this concern cross-banding and back veneers used are nearly all one-twenty-fourth-inch poplar, with a very small proportion of such sliced oak veneers as are not good enough for face stock. The face veneers used are sliced one-twenty-eighth-inch oak. All five-ply work is glued in two operations, that is, the core is first veneered with the cross-banding and when this comes out of the bales in which it sets over night it is put on sticks and left to dry out for six days. It is then taken to the sander where about one-half of the cross-banding is sanded off, thus leaving the cross-banding about one-forty-eighth-inch thick when the face and back veneer are put on. When this is finished it is left on sticks another six days before the face and back veneers are sanded. Upon inquiry it turned out that the main reason for gluing-up this five-ply stock in two operations, and giving it the twelve days' drying out, was that, inasmuch as the operators wished to lay up the veneer slightly damp on the theory that it would lay flat, and cause less trouble in splicing, there would be less likelihood of the finished work drying out and checking afterwards.

"In Austria, I saw a machine which to me was something new. This was a miniature lathe, specially constructed for the purpose of turning down the cores from the large lathes. These cores, of an original diameter of from five to six inches, were placed in this small lathe, or 'coffee grinder' as the owner of the plant called it, and turned off until a core of only about one and one-half or one and three-fourths inches diameter remained. The veneer produced by this small lathe was naturally not of a quality suitable for anything outside of core stock, to be used on the cheaper grades of panels, etc., but for this purpose the veneer thus recovered, and which ordinarily would have gone to waste as cores, answered the purpose just as well as veneers cut from the original log."

With light, high-speed shafting, and concrete for foundations, the problem of keeping machinery in correct alignment should be a very simple one in these days, calling for but little expenditure of time and money.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1/16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum.
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

MAHOGANY LUMBER—VENEERS–Foreign and Domestic
Fancy Woods—Panel Stock

Veneers in all thicknesses from 1/28″ to 1/4″

We make a specialty of 1/20 Mahogany Veneers both sliced cut and sawed. Write us.

HUDDLESTON-MARSH LUMBER CO., 2260 Lumber Street
CHICAGO, ILL.

Producers and Manufacturers

MAHOGANY Mexican, African
Cuba

CIRCASSIAN WALNUT
(Poti Wood)

East India Mahogany (Andaman Islands)
San Domingo (Direct Importation)

All Imported Woods in

LUMBER and VENEERS

Request our District Salesman to call upon you with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,
Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality.

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana White Oak Timber and make the best grade of quartered oak Veneers put on the market.

Write Us for Prices

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

We have here in Chicago the most modern and best equipped Veneer and Band Saw Mill in America

The first order will make you our permanent customer—Because:—

We manufacture right, so—
Our product is right.
We carry a large stock, so—
Our shipments are right.
We have a labor saving mill, so—
Our prices are right.

We Specialize in Oak and Mahogany Veneers, sawed and sliced. Also Quartered Oak and Mahogany Lumber

Let us know your wants

Fred W. Black Lumber Co.

2245 So. Crawford Ave., CHICAGO, U.S.A.

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for

Poplar and Red Gum Veneers and Crossbanding

H. C. HOSSAFOUS

MANUFACTURER OF

Sliced Quartered White Oak Veneer

Genuine Indiana and Ohio white oak logs, cut into flitches at our own plant, **perfectly smooth cut and dried flat** and without gloss.

We can help you solve your Sliced Oak Problems
Let us quote you on your Requirements

DAYTON, OHIO

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES— - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS
American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:

BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM
Quartered

3 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
3 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

RED GUM
Plain

4 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
1 " 10/4 "
2 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

THE FAMOUS CACHE RIVER GUM
Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

Cincinnati Veneer Co.

Manufacturers of

Veneers

and thin lumber in all thicknesses

Poplar, Oak, Walnut, Gum,
Maple, Ash, Rotary,
Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments.

Stock all well manufactured from selected logs and roller dried.

Cincinnati -:- Ohio

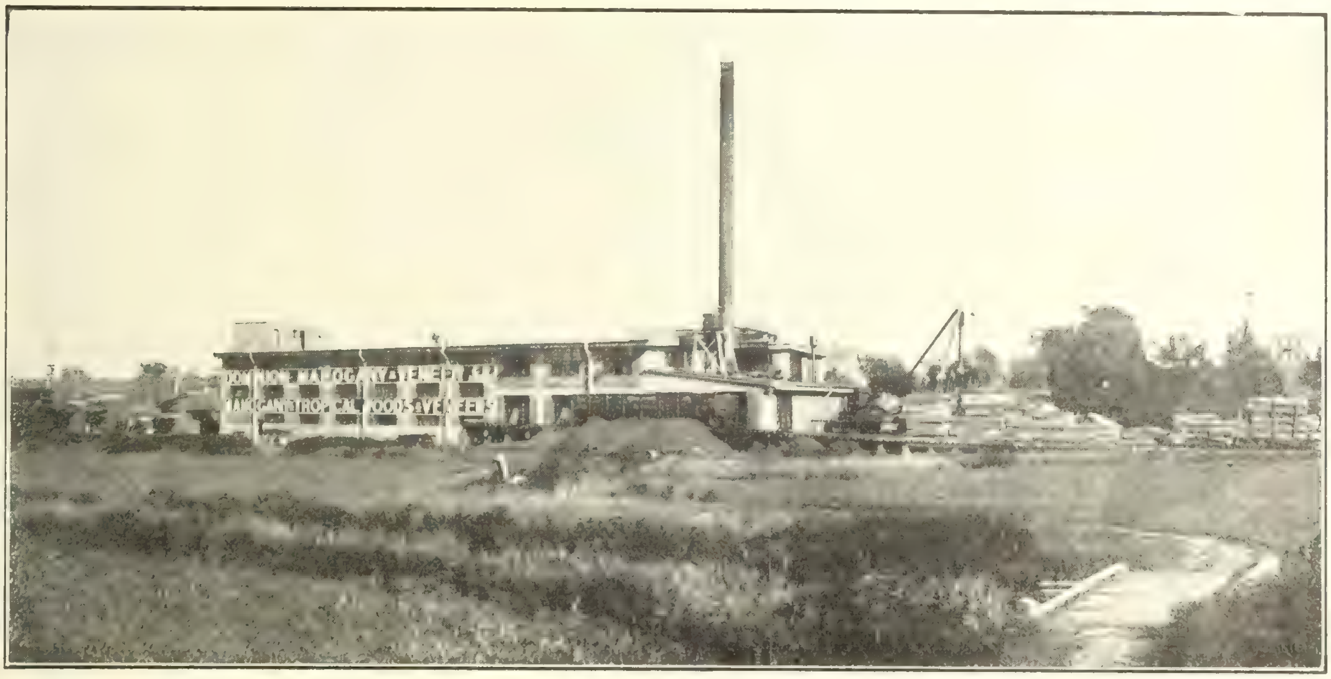
OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

The Dominion Mahogany & Veneer Co.

Limited



The Pioneer Mahogany Mill of Canada

LUMBER— African, Mexican, Cuban Mahogany, English Oak, Teak, Black Bean and Vermillion.

VENEERS—Sawed, African and Mexican and Cuban Mahogany, Maple, English Oak, American Quartered and Plain Oak 1/20"-1/4".

Sliced, African and Mexican Mahogany, Circassian Walnut, Italian Walnut, Birch, etc. 1/24", 1/20", 1/16".

ROTARY CUT— Birch, Maple, Ash, Gum, Poplar 1/24"-1/4".

Drawer Bottoms and Pin Block Veneers and Door Stock.

MADE IN CANADA

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

Dominion Mahogany & Veneer Co., Limited

MONTREAL WEST, QUE.

The Hardwood Market

CONDITIONS in the hardwood market generally may be described as unchanged since last month. The unsatisfactory weather conditions which have prevailed all over the country for some time past have proved a strong factor in retarding the development of the lumber market. It cannot be denied that the note of optimism which was struck by many dealers since the beginning of the year has not altogether been justified by subsequent events. The hope was held out of an early and satisfactory revival in the demand for hardwoods, and in view of the fact that general buying was more active in January than for many months previous, some disappointment has been occasioned owing to the slowness in trade recovery. It is quite true, however, that reports of a most favorable character are coming in as to business that is now being done. Taking a broad view of the situation there do not appear to be any grounds for pessimistic forebodings. The revival of building operations and construction generally is upon us, and with it there is every reason to hope for a decided stimulus in the demand for hardwoods of all kinds in the next few weeks. From the record of building permits to hand from various parts of the country it is reasonable to assume that already there is an active movement in the building field. In this connection, plans on an extensive scale are maturing for operations which should certainly have the desired effect of brightening the outlook for hardwood dealers generally. While furniture makers held off slightly, following the Exhibitions, still it is satisfactory to note that they have come into the market recently with the result that the demand for stocks to their liking has been decidedly more brisk. The woods that appear to have profited by this revival are plain and quartered oak and sap gum. With increased activity in building there is certain to be an increased call from the factory trades to take care of the furnishings of such structures as are erected. Thus the situation appears to have a decidedly favorable outlook.

Regarding prices, birch of some thicknesses has depreciated a little, but against that, ash has held its own a little better. Prominent dealers are looking for improved conditions shortly, but to what extent is a matter which the future alone can disclose. Yellow pine has flooded the market on account of the very low prices being quoted, and if continued, this circumstance must necessarily affect the price of hemlock and low grades of pine. Good white pine is rather difficult to dispose of at the present juncture, even at lower prices than were quoted a month ago. This is accounted for very largely through the offering of California pine at reduced figures. For some time past oak has been slightly off in some markets, but it is probably the fact that such a condition is more the result of offerings on the part of those heavily stocked in this class of lumber who desire to turn over some ready money. It is earnestly to be hoped that a trade revival will take place very shortly, that business will be moving and that the long-looked-for return to normal conditions will not be unreasonably delayed.

Reviewing the situation the Hardwood Record says:—

"There has been a very apparent increase in the inquiry all over the country for all items of hardwoods. This does not mean that actual buying has increased, but indicates that the buyers have come to realize that there is a probability of prices going up materially in the near future, and they are using this means of feeling out the trade to find out exactly just what the situation is and what the prospects are for the immediate future. An illustration of the present trend of buying is seen in the case of a large veneer concern which maintains a constant stock, adequate to meet all orders for immediate shipment that might come in. It is not the usual policy as prevails in the veneer business, and this concern has made a specialty of orders of this kind. It keeps an enormous stock of veneers in its warehouses, and states that while the veneer business in general has not been in any too good condition for some little time, its business has been maintained on a better level during the easing up of the general veneer situation of late than it has ever attained before, which of course, is conclusive proof that the majority of the orders for veneer stock have been for immediate shipment and of a moderate size. Generally speaking, continued optimism reigns in all lines, and there is certainly every indication that the return of spring weather, accompanied by the opening up of building and other operations, will see the situation shaping up into a much more favorable condition."

Discussing the leading southern and northern hardwoods The American Lumberman writes:—

"Greater activity is reported in the hardwood market. Advices from various consuming centers indicate a fair and growing movement of the leading kinds of southern and northern hardwoods. Still, consumers evidently are buying with caution and are thus avoiding accumulations. The furniture trade should be a heavy consumer of lumber this spring, especially in the middle west, as buyers at the shows in January are reported to have placed orders with a good deal of their old-time vim and all were firm in the belief that business this year would be good. Reports from some sections are contradictory. Some have it that there is really good business, while others report that only a moderate amount is on the way. The cold weather in the last ten days has hurt the hardwood trade, but this is considered a temporary effect only. Oak has come in for more attention, with plain red a little more active than the balance of the list."

The Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., March 18.—The situation in the hardwood and veneer trade is peculiar, and presents many unusual points of interest at this time.

Business is undeniably quiet, and the result of the slow trade during the past six or eight months, and especially since January 1, is shown in the depressed prices at which certain items are selling. Firsts and seconds plain oak, for instance, is selling probably $2 below what is considered to be a fair price for the wood. On the other hand, quartered oak is in relatively good demand, prices have held up, and the lumbermen report that stocks of the wood are not at all plentiful. Quartered red oak, for instance, is almost out of the market. This is because of the fact that the price of plain and quarter-sawed red oak are so close together at present that it would be unprofitable for

For Sale

One Table Leg Machine, also one Dado Machine, well equipped, and in first-class condition. Apply to

THE M. F. BEACH COMPANY,
3-4-5 Winchester, Ont.

For Sale

Three-drum Smith Sander; surface planer, steam press for composition work, band saw, filing machine, 15 h.p. motor (direct); Shimer heads, 3/8 flooring heads, No. 3 Sheldon fans; all in first-class condition. Apply

GOLD MEDAL FURNITURE MFG. CO.,
3 Toronto, Ont.

Traveller Wanted

A United States firm selling hardwoods in Canada desires to open up negotiations with a live salesman; commission preferred, but if results can be shown, would enter into permanent selling arrangement. Box 25, Canadian Woodworker, Toronto. 3

Wanted general foreman for sash, door and high grade working department. Town of 10,000. Must get good results from machine and benchmen, also able to bill, lay out and detail, frames, store, bank special interior fittings. State past and present employment, age and salary expected. Strictly confidential. Box 26, Canadian Woodworker, Toronto. 3

Veneer Agency

Large American manufacturer of veneers and thin lumber wants a representative to travel Ontario and Quebec on a commission basis. Exclusive territory. Apply Box 32, Canadian Woodworker. 3-4

Box Machinery Bargain

One Dovetail Machine.
One Setting Up Machine.
One Four Saw Trimmer—Self Feeding, made by Dovetail Machine Company, St. Paul, Minn.
One No. 22 Box Trimmer, made by Fischer Machine Works, Chicago, Ill.
All cost $3,300—Will sell for $1,000.

Inquire THE GLOBE SOAP COMPANY,
3-4-5 Cincinnati, Ohio.

7% INVESTMENT 7% **PROFIT SHARING**

Sums of $100, $500, $1000 and up. Safe as any mortgage. Business at back of this Security established 28 years.

Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

Stock Panels

We carry in our shipping room at all times a large assortment of stock panels, mostly 3-ply, ¼ inch thick, in **Plain Oak, Quarter Sawed Oak, Mahogany, Birch and Maple,** both one and two good sides from which we *can ship same day order is received.*

Veneer panel making is our specialty, and we claim that the panels we make are cheaper in the long run for they

Will not come to pieces after they are in the furniture

Do you see the point?

Send us your orders, or ask for Stock List

If we do not have on hand what you want, can build and ship promptly anything in 3 or 5-ply.

The
Gorham Brothers Company
Mt. Pleasant, Mich.

PATENTS

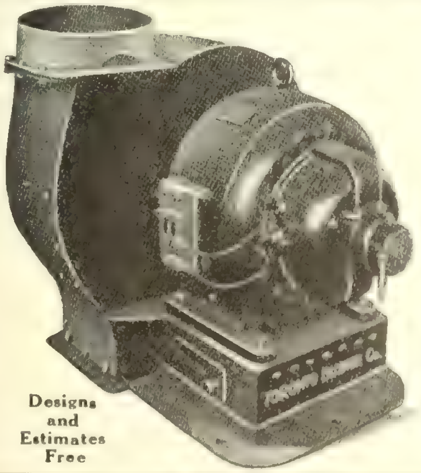
Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

PATENTS

STANLEY LIGHTFOOT
Patent Solicitor and Attorney
Canada $45.00 United States $65.00
Lumsden Building - TORONTO, CAN.



Designs and Estimates Free

REDUCE YOUR FIRE RISK

and Consequent Cost of Insurance

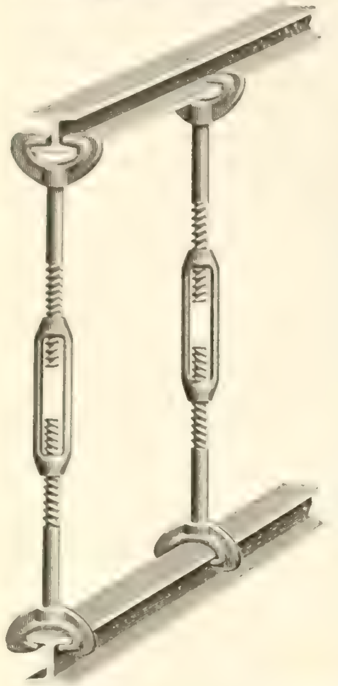
Increase the Efficiency of your Plant by Installing our Slow Speed Low Power

EXHAUST SYSTEMS

which carry off the refuse from machinery and feed combustible material to furnaces for fuel or deposit it into a suitable receptacle.

—Improved Automatic Furnace Feeders

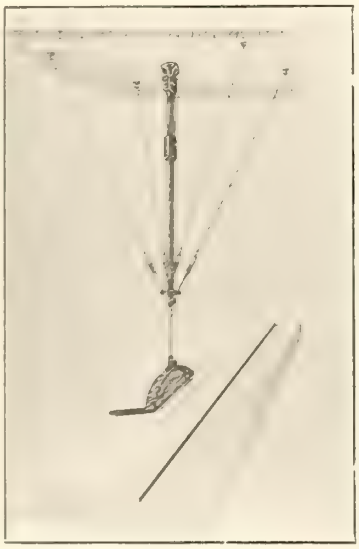
Toronto Blower Co., 156 Duke St., Toronto, Ont.



Order a Sample Lot Now
Single Beam Retaining
CLAMPS

No Hydraulic Veneer Press a complete success without them, also advantageous for Hand Screw and other Veneer Presses.
Work done at least twice as fast.
Clamps adapt themselves to different widths of stock.
Easily handled, quickly placed, tightened and released and hold stock securely.
Will not "eat you up" in repairs, nor create a "scrap heap."
No. 1 for stock up to 18-in. wide
No. 2 for stock up to 24-in. wide
No. 3 for stock up to 30-in. wide
No. 4 for stock up to 36-in. wide
And larger sizes.
State daylight or opening of your press, and Clamp Rods will be made accordingly.
Users say these Clamps are one of the best investments they ever made.

Chas. E. Francis Company
Largest Manufacturers of Glue Room Outfits
RUSHVILLE - - - INDIANA, U. S. A.



Manufacturers and Jobbers
Watch The BASS Grow
Safety Appliances

"Automatic" Ceiling Suspended Wire Hood Circular Saw Guard. Model "D"

In Position Protecting Saw

This guard is unquestionably superior to all Circular Saw Guards on the market. It is entirely automatic and self-adjustable, and material when placed in position for cutting will automatically raise the guard and when the work is completed the Saw Guard will automatically drop back into place.
In construction this Guard is very simple, it being counterbalanced by a weight which runs on the center tube. All clumsy pulley arrangements have been eliminated. Its rigidity is a great redeeming feature.
Price $14.00 Net F. O. B. Factory
Furnished complete with the exception of the long pipe from ceiling which is standard 1-in. pipe and sold at 8 cents per foot extra. When ordering, specify distance from ceiling or bottom of girder to top of saw table. Guard regularly equipped with hood for saws 18-in. and under.
Complete Safety Device Catalogue "To Protect Yourself Protect Your Workers" sent on request.
Splendid proposition for "live wire" agencies.
BASS BROS., 82 Walker St., NEW YORK

the lumberman to quarter his red oak logs. The result is that only white oak logs, which produce lumber worth $10 or $12 a thousand more than red oak, are cut up in that way.

Some other hardwoods are picking up. Chestnut, which for a time was unusually dull, has revived, and sound wormy, which, of course, is one of the leading woods used for corestock purposes, is being rapidly cleaned up. Many producers report that this and other low-grade woods are oversold, and that prices are pretty certain to advance. Since the first of the year chestnut has been increased in value $1 a thousand, and still further increases are likely to be posted before long.

Gum, which is becoming a popular wood for interior trim and furniture manufacturing, is selling below its normal value, it is believed, the depressed condition of the export trade having been one of the causes of this. Those interested in the use of this wood are therefore in a position to get material at a lower price than is ordinarily the case. The splendid results obtained with the wood, which is comparatively low-priced considering the values of other high-grade materials, seem to make it an excellent buy at this time. Figured gum veneers are coming into strong demand, and with both furniture manufacturers and millwork people taking up the wood, the vogue of figured gum will soon be well established.

The fact that the supply of hardwoods is small, everything taken into account, makes the situation peculiar, as remarked at the beginning of this report. The only explanation of the quiet condition of the market of course is that the demand has been below normal, and thus the small quantity of stock dry and ready to ship has not been emphasized. It is a fair statement, however, that if business revives at anything like the expected rate the result will be a rapid rise in values, due to the inability of the lumber trade to supply the call. Low-grades in nearly all lines are in only fair supply, and good lumber in a few lines like plain oak is the only stock which at present is in what appears to be excessive supply. Hence a buying movement of any considerable extent would disclose the true situation and would result in a strengthening of the market all along the line.

The fact that the export market is off and that the railroads are buying as little as possible, in view of the difficulty they are experiencing in securing increased railroad rates, is helping to hold down the market. Whether these big factors will be adjusted favorably to a strengthening of the situation is not yet apparent, but at all events no marked change in this direction is likely for several months.

Taking it all round it is apparent that the market offers an opportunity for the shrewd buyer to pick up some good bargains, and the man who is sufficiently well-informed as to his future needs and the probable change in quotations on hardwoods ought to be able to "clean up" during the next few months.

Depreciation is a factor that is as uncertain and as variable as overhead cost. The selling value of a machine is seriously impaired the minute it has been used and becomes second-hand, though it may give just as good service as ever for a number of years. Another factor that some fail to take into account is that the coming of a new and improved machine may lessen the value of the old, even though it does as much work as it ever did.

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

Section of main floor Exhibit and Salesrooms

52 Lines
of New
Machinery
the Largest
Stock in
the World.

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

Where You Get the Order and Make a Profit

Machine does everything shown above.

By using a

Perfect Window Frame Machine

you can manufacture window frames at a price that puts the man with hand-made frames out of the running, and still make a ***very comfortable profit.*** It not only lowers the manufacturing cost of window frames but it improves the quality of the product.

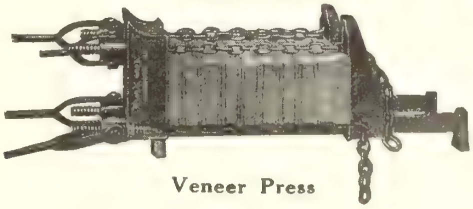
Send for our catalog.

Smith & Phillips Mfg. Co.
412-422 N. Sangamon Street, CHICAGO, ILL.

Better ask for particulars of our Stair Router, Edge Jointer, Sash Groover and Light Shaper, an ingenious and effective tool.

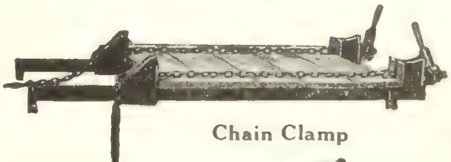
"Pioneer" Moulding Sander Power Veneer Presses

Cabinet Clamp



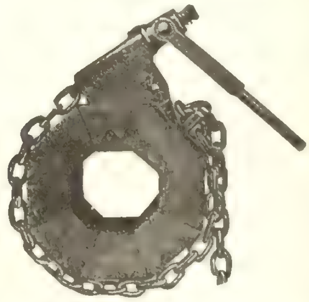
Veneer Press

Write for
Catalogue
and Prices



Chain Clamp

Black Bros.
Machinery Co.
Mendota, Ill.



Column Clamp

LISTEN

We are one of the largest manufacturers of special **Hardware for Store Fixtures and Show Case Manufacturers** in the World. Our latest catalogue fully describes every metal specialty you use in show cases and store fixtures. Send for a copy—It will save you money.

The Reflector & Hardware Specialty Mfg. Co.
Western Ave. and Twenty-Second St. - - - CHICAGO, ILL.

News of the Trade

The Imperial Bank of Canada have decided to purchase a large quantity of fixtures for their branch office at london, Ont.

The stock of the Kindel Bed Company, Toronto, was damaged to the extent of $3,000 by a fire which broke out from an unknown source recently.

A loss computed at $5,000 was sustained by Mr. Joseph Bouchard in a fire which completely destroyed his sawmill at St. Jerome, St. Paul's Bay, Que., on March 9.

Port Stanley, Ont., is to have a new industry in the form of a broom factory which will be in operation shortly under the management of Mr. Lorne Lee, of St. Thomas.

La Compagnie Electrique Des-Rivieres has been incorporated for the manufacture of furniture, sashes and doors, with head office at Notre Dame de Stanbridge, Quebec.

Mr. Eugene Bayette, 103 St. Francois Xavier Street, Montreal, Que., is receiving quotations for a supply of opera chairs for the new library on St. Dennis street, Montreal.

The ratepayers of Stratford have passed a by-law, voting $3,500 for a site and fixed assessment to Mr. Charles Diebel, Hanover, who is erecting a furniture frame factory in Stratford.

Mr. John Ferguson has transferred all his interests in the business as furniture manufacturer and undertaker in London, Ont., to his two sons, A. K. and Robert R. Ferguson.

The Shurly-Dietrich Company, Limited, of Galt, whose handle factory was burned down some time ago, have got a temporary factory in operation pending the re-building of the plant.

The Westminster Woodworking Company, whose plant on Lulu Island, B.C., was destroyed by fire recently, have announced that the plant will be rebuilt and in running order early in the summer.

A by-law has been passed by the ratepayers of Stratford, Ont., granting a fixed assessment of $7,500 to the Stratford Manufacturing Company, Limited, for the purpose of building an extension to their factory.

At the annual meeting of Quality Beds, Limited, Welland, it was decided to extend the number of lines manufactured by adding wooden bedroom furniture, including bureaus, chiffoniers, dressers, beds and chairs.

Dr. B. E. Fernow, dean of the forest school of the University of Toronto, has been elected president of the Society of American Foresters, the only organization of professional foresters in the Western Hemisphere.

Prominent among the industries that are advancing rapidly in the Maritime Provinces is that of the Windsor Furniture Factory, Nova Scotia. This firm has organized a large export trade to South Africa and other countries.

A sash and door factory and sawmill, owned by Mr. J. R. McLaurin, Jr., was completely destroyed by fire recently, involving a loss of about $8,000. The cause of the fire is unknown and the loss is partially covered by insurance.

The Imperial Steel and Wire Company, Limited, of Collingwood, Ont., are about to erect a wood-screw factory at an expenditure of $10,000. Bonds in connection with the project have already been guaranteed by the ratepayers.

The Canada Pole and Shaft Company, Limited, has been incorporated with a capital stock of $400,000 to manufacture shafts and vehicles of all kinds, plant, machinery, implements, etc. Their chief place of business will be at St. Catharines, Ont.

The Emmett Company, Limited, have been incorporated for the purpose of dealing in sashes, doors and lumber, with head office in Toronto. The provisional directors are Messrs. Gordon B. Coyne, Norman J. Macdonald, and Elena Duggan.

The factory of the Canada Furniture Manufacturers of Woodstock, Ont., was seriously damaged by the recent storm. Portion of the north wall of the factory, over the packing room, gave way and a large quantity of finished goods was damaged.

An exhibition of Forest Products will be held in Chicago from April 30 to May 9, and in New York from May 21 to 30. The oak manufacturers of the United States have appointed a committee to formulate plans for an exhibit of their products.

Machinery is being installed in the new mill at Papineauville, Que., for the manufacture of cheese box veneers and cheese box headings. The owners are the Papineauville Lumber Company, Limited, and the factory is expected to be in operation early next month.

A new company to be known as Orme Limited, has been incorporated for the manufacture and sale of pianos and other musical instruments. The head office will be at Ottawa, and the provisional directors include Messrs. F. L. Orme and Martin Orme.

The Kelowna Implement Company, Limited, has been incorporated with a capital of $25,000 to acquire as a going concern the business of Coates, Edwards & Gowan, of Kelowna, B.C., and to carry on the business of implements, etc., with head office at Kelowna.

The Tambyll Upholstering & Frame Manufacturing Company, Limited, Montreal, in liquidation, is offered for sale. Unsealed tenders addressed to Mr. James Renwick, liquidator, 223 Board of Trade Building, Montreal, will be received up to and including March 25.

A by-law will be submitted to the ratepayers of Orillia, Ont., on March 30 to request their sanction to a loan of $50,000 to Messrs. J. R. Eaton & Sons, Limited, who are contemplating the building of a woodworking factory on West street at a cost of $100,000.

The London and Petrolea Barrel Company, Limited, as successors to the London and Petrolea Barrel Company, who have become co-partners in the new firm, has been incorporated with a total capital stock of $500,000 for the manufacture of boxes, barrels, casks, etc.

With a capital of $10,000, the Merritt Hardware & Sporting Goods Company, Limited, has been established to carry on the business of manufacturing hardware supplies, including metals of all kinds, machinery, furniture and sporting goods. The firm's headquarters is at Merritt, B.C.

The citizens of Parrsboro', N.S., are thinking of starting a chair factory in that town. The owners of an old factory building with considerable machinery are stated to have offered to invest the price of the property in the stock of the new enterprise if this site is chosen for the new chair factory.

La Compagnie de la Riviere Kiamika, Limited, has been incorporated with a capital of $25,000, to do business as lumber merchants, with head office at Val Barrette, Que. The provisional directors are O. Girard, of Mont Laurier, N. A. Chevrier, of Val Barrette, N. Page, of Nominingue, J. B. Lafleur, Kiamika.

The William English Canoe Company, Limited, have been incorporated to carry on the lumber, saw and planing mill business, build canoes, sailing and other boats. The head office is situated at Peterborough, and the provisional

TIMMS, PHILLIPS & CO.
VANCOUVER, B.C. Limited

Write us for attractive prices on

Clear Douglas Fir
Clear Red Cedar
Clear Spruce

Also XXX Red Cedar Shingles

Canadian
Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

The Atlantic Lumber Co.

Manufacturers and
Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers - TORONTO
Phone Main 6386
HOME OFFICE, BOSTON, MASS.
Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Special Prices

Will be quoted on the following stock:

2 cars 4/4 No. 1 Com. and Bet. Red Birch.
2 " 4/4 No. 1 Com. and Bet. Unsel. Birch.
1 " 8/4 1st and 2nd Unsel. Birch.
1 " 10/4 No. 1 Com. and Bet. Unsel. Birch.
2 " 6/4 No. 2 Com. and Bet. Soft Maple.
1 " 12/4 No. 1 Com. and Bet. Soft Maple.
1 " 6/4 No. 1 Com. and Bet. Hard Maple.
1 " 5/4 No. 2 Com. and Bet. Brown Ash.
1 " 6/4 No. 2 Com. and Bet. Brown Ash.
4 " 6/4 No. 2 Com. and Bet. Soft Elm.
1 " 8/4 No. 1 Com. and Bet. Soft Elm.
2 " 12/4 No. 1 Com. and Bet. Soft Elm.
3 " 4/4 No. 1 Com. and Bet. Basswood.
1 " 5/4 1st and 2nd Basswood.

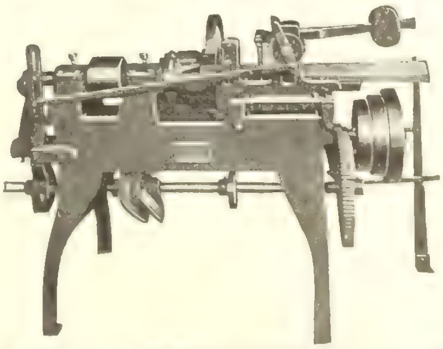
Above stock is dry and perfectly manufactured. If what you want is not listed write us anyway, as we have a complete stock of hardwoods.

Stevens & Jarvis Lumber Co.
Eau Claire, Wisconsin

For Long Timbers
Surfaced or Rough
in Douglas Fir
or for
B.C. Red Cedar Shingles
Write or Wire

W. G. Scrim Lumber Co.
Vancouver, B.C.

Makes Wooden Plugs from Scraps



The demand for wooden plugs to jam the ends of big rolls of paper is much greater than the supply. The paper mills can't secure enough of them. This machine automatically makes 20,000 of these plugs in ten hours, from short stock and scraps around the plant. We have full particulars which we will be glad to send you. Testimonials? Yes, lots of them. Better write us to-day.

EAGLE MACHINE WORKS, 332 Market St.
Indianapolis, Ind., U. S. A.

Buy Direct
From the Manufacturer
We are their Salesmen

The
Saw Mill Owners
Sales Co.
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston
New York
Watertown
Montreal
Quebec
Toronto

Ash
B.C. Doors
Birch
Basswood
Beech
Cherry
Cedar
Chestnut
Cottonwood
Elm
Fir Finish
Hickory
Hemlock
Maple
N.C. Pine
Oak
Poplar
Red Gum
Red Pine
Sap Gum
Spruce
Sycamore
Shingles
Tamarac
Timbers
Walnut
White Pine
Yellow Pine

We Solicit Your Inquiries

directors include Mr. James English, Mr. S. W. English, and Mr. A. E. Peck.

The Sutherland-Innes Company, of Chatham, Ont., have recently purchased the entire holding in Kent county of Mr. W. M. Drader who for several years has been prominently identified with the manufacture of barrels. This plant has been handling about two million feet of logs and has an output of 100,000 barrels annually.

Work on the Great West Furniture Company's new warehouse at Saskatoon, Sask., is proceeding rapidly. The building, which will be ready for occupation early in April, is to be used for the storing and showing of the company's stock. The warehouse will be steam heated and finished in boards.

The firm of Sherer & Garrett, of Chicago, manufacturers of clean food counters, have decided to locate in Guelph, Ont. Plans for a new factory in the eastern limits of the city, close by the C. P. R. tracks, are in course of preparation. Mr. W. J. Russell will be the general manager for Canada.

A private company to be known as Drayton Mills, Limited, has been incorporated for the manufacture of woodworking materials and lumber. The capital of the company is $50,000, and the head office will be in Toronto. The provisional directors are Messrs. A. C. MacNaughton, C. W. Livingston, and J. S. McLaughlin.

Mr. Edward Bibby who was the proprietor of a basket factory until a few years ago when he retired in favor of his two sons, passed away at Dundas, Ont., on February 24 at the age of seventy-five years. The late Mr. Bibby was a native of Lancashire, Eng. He has been a resident of Dundas for the past twenty-six years.

Toronto Company's New Enterprise

The plant of the Beverley Interior Company, manufacturers of interior fittings and cabinet work, 83 Richmond Street West, Toronto, was taken over recently by a new company known as Woodworkers, Limited. Under the new auspices the same line of manufacture will be followed, but as time goes on it is the intention of the company so to develop the buiness that all kinds of hotel, office and other fittings will be manufactured with the object of catering to the trade in general. The firm produces an excellent range of interior fittings and cabinet work, the principal woods utilized in the factory being plain and quarter-cut oak, mahogany, walnut, poplar, birch, maple, basswood, pine, cypress, ash and elm, all the firm's lumber being obtained from the Canada Lumber Company.

The factory comprises machinery room, sanding room, cabinet room, finishing room and stock room. Up-to-date machinery is installed including band-saw, self-feed rip saw, trim saw, shaper, planer, sander, mortiser, turner, and several finishers. Most of the machinery was supplied by H. W. Petrie, Limited, Toronto. The drills and implements used in the factory are from the firm of Cowan and Company, of Galt.

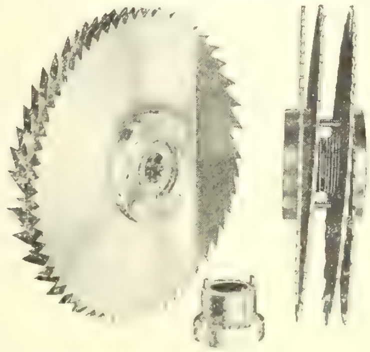
The company specializes in the fumed oak finish, having found by experience that this finish is in most demand. Other finishes done include golden oak, weathered oak and early English.

The president of the company is Mr. P. W. Heeney; the vice-president, Mr. L. F. Strickland; and the secretary, Mr. Alex. Beverley. Under the new auspices Woodworkers, Limited, is wished much success in its enterprise.

Sawmill waste of Douglas fir is now coming into use as a material for the manufacture of paper pulp.

Trade FOX Mark

ADJUSTABLE



DADO HEADS

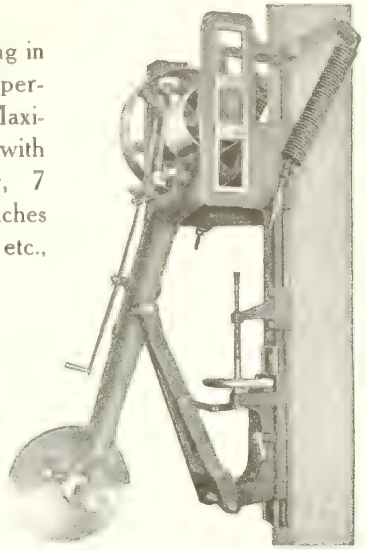
These heads, when open, cut a groove twice the width of groove cut with head closed, and they will cut absolutely any width between these extremes.

Write for Descriptive Literature

FOX MACHINE CO.
645 Front Ave., N.W., GRAND RAPIDS, MICH.

PRYIBIL No. 5 Parallel Saw and Groover

This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.



P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited
Hull, Quebec

Stewart-Greer Lumber Company

Band Mills
Mangham, La.

General Offices
St. Louis, Mo.

We ship only from our own mills, and do not carry stocks in St. Louis or any place except the mills.

All of our stock is BAND SAWN, cut from large Virgin Timber and well manufactured. We are in position to make immediate shipments of the following dry lumber:—

RED GUM
2 Cars 1/2 in. 1s and 2s
25 Cars 4/4 in. 1s and 2s
20 Cars 4/4 in. No. 1 Com.

QUARTERED WHITE OAK
1 Car 4/4 in. 1s and 2s

PLAIN WHITE OAK
10 Cars 4/4 in. 1s and 2s
10 Cars 4/4 in. No. 1 Com.
10 Cars 4/4 in. No. 2 Com.

SAP GUM
3 Cars 5/8 in. 1s and 2s
8 Cars 3/4 in. 1s and 2s
20 Cars 4/4 in. 1s and 2s
10 Cars 4/4 in. No. 1 Com.
10 Cars 4/4 in. No. 2 Com.

PLAIN RED OAK
10 Cars 4/4 in. 1s and 2s
10 Cars 4/4 in. No. 1 Com.
10 Cars 4/4 in. No. 2 Com.

Southern Red and Sap Gum

Our Specialty

Plain and Quartered sawn, and sorted for Mahogany or Circassian Finish. We guarantee our Gum to be as straight as any other wood. If you have used gum and had bad luck, let us talk to you about it, and if you have never used gum and desire a fine cabinet wood that will take any finish let us tell you how to get the best results. Also

Fine Figured Quartered White Oak

G. H. Evans Lumber Co.

Hardwoods and Pine
CHATTANOOGA, TENNESSEE, U. S. A.

LUMBER

Good Grades **Right Prices** **Prompt Shipments**

WE have a complete stock of Canadian Hardwoods on hand and ship on National Hardwood Association Rules of Inspection. Let us quote on your lumber wants. Here is a list of some items we want to move for piling space.

150 M ft.	4/4	No. 2 & No. 3 Com.	Birch
100 M ft.	4/4	No. 1 Com. & Betr.	"
8 M ft.	5/4	"	"
20 M ft.	6/4	"	"
25 M ft.	8/4	"	"
10 M ft.	10/4	"	"
28 M ft.	16/4	"	"
20 M ft.	8/4	"	Soft Elm
6 M ft.	16/4	"	"
50 M ft.	12/4	"	Rock Maple
10 M ft.	6/4	"	Beech
25 M ft.	4/4	No. 2 Com. & Betr.	Oak

C. G. Anderson Lumber Company, Limited

Manufacturers and strictly Wholesale Dealers

Manning Chambers, Toronto

INDIANA HARDWOODS

Young & Cutsinger
Manufacturers and Wholesale Dealers

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

OAK
Quality First Brand
GUM

Licking River Lumber Co.
114 Lumber Street
SOUTH BEND, INDIANA

Long-Knight Lumber Company
Circassian, Veneers, Mahogany
Hardwood Lumber

INDIANAPOLIS - - INDIANA

OHIO
Hardwood Manufacturers and Dealers

Distributing yards :—Baltimore, Md., Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co., CINCINNATI, OHIO.

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES.

THE

GOTSHALL MFG. CO.

TOLEDO, OHIO

Hardwood Manufacturers

We carry dry stock in

Quartered and Plain White and Red Oak,
Ash, Hickory, Cottonwood,
Sycamore, Cherry
Walnut & Poplar

cut from Northern Ohio timber

¶ We solicit enquiries for furniture, bending and wagon stocks, timber and piling. We have two Band Mills.

5/8″ Soft Yellow

POPLAR

Selected to Widths

7 to 11″ wide 18 to 23″ wide
12 to 17″ wide 24 to 28″ wide
29 to 37″ wide

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber—Hickory Axles

Charles F. Shiels & Co.
CINCINNATI, O.

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker". They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO
—We make a specialty of—

Mills:
Kentucky Tennessee
W. Virginia

Soft Texture Red and White Oak
Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of
DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4

Wire our expense if in need of any of above stock.

Shawnee Lumber Company
CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chesnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Write for a quotation on this space—it will put you in touch with hardwood consumers.

OAK and RED GUM
OUR SPECIALTY

At our Tennessee mill we are producing some choice
Plain and Quartered Red and White Oak. Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

Prompt Shipments and High Grades our Hobby.

Let us quote you on your requirements.

Mills—TENNESSEE
ARKANSAS

DUHLMEIER BROTHERS

Main Office & Yard
CINCINNATI, OHIO,
U. S. A.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sinker-Davis Co., Indianapoils, Ind.

BAND SAWS
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R.. Toronto.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.

EDGERS (Gang)
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Bass Bros., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Anderson & Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Licking River Lumber Co., South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Sawmill Owners Sales Co., Montreal, Que.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Stevens & Jarvis Lumber Co., Eau Claire, Wis.
Stewart-Greer Lumber Co., St. Louis, Mo.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Natkins, N.Y.

JOINTERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Anderson Lumber Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.

MACHINE KNIVES
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa
Sidney Tool Co., Sidney, Ohio.
Smith & Phillips Mfg. Co., Chicago.
Whitney & Son, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Natkins, N.Y.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS
Bass Bros., New York.

SANDERS
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Bass Bros., New York.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

SAW JOINTERS
Diehl Machine Works, G. M., Wabash, Ind.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Williams Machinery Co., A. R., Toronto, Ont

SHAPERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby Company, A. B., Toronto, Ont.
Sheldons Limited, Galt, Ont.
Toronto Blower Company, Toronto
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio

SPRINKLER EQUIPMENT
Keiths, Limited, Toronto.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Sidney Tool Company, Sidney, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WINDOW FRAME MACHINERY
Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE
Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher and the Ambitious Student.

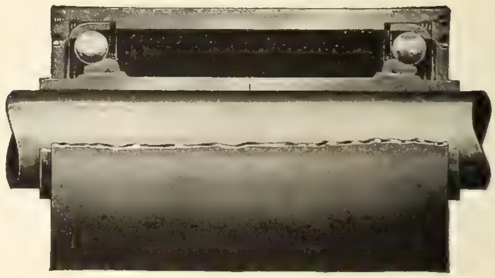
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS

BRAND
VEGETABLE

GLUE

HOLDS THE WORLD   HOLDS THE WORLD

SETS—STICKS—STAYS

From A Customer

"It is unusual to improve the quality and lower the cost at the same time—and yet this is what Atlas has done for us."

You Are Going to Use Atlas Glue Eventually

Our research department will continue to keep us as far ahead of the" just as good's" as we are right now; and the sooner you write us about your work and learn what we can do for you, the better off you will be.

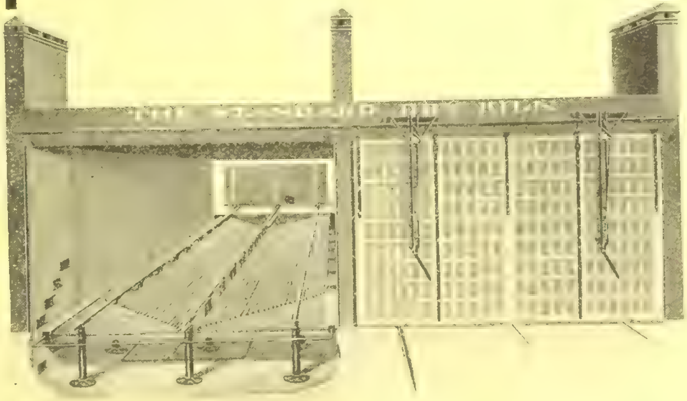
Quality First—Then Economy—Atlas Gives You Both.

National Process Company
Manufacturers
Indianapolis, Indiana, U. S. A.

It's E-Z

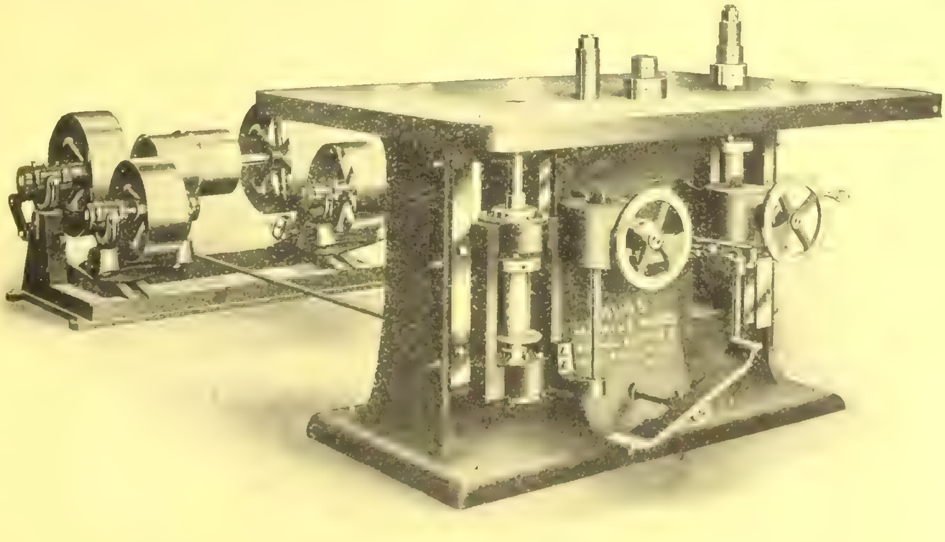
to keep the drying conditions under **close control**. That's why The Standard Moist Air Drying System is so perfectly adaptable for veneers and hardwood flooring. That's why it's the right kiln for **your** product. We'll **guarantee** the results.

The catalog contains a lot of facts about lumber drying that you ought to know. Write for it. Address: The Standard Dry Kiln Co., 1560 McCarty Street, Indianapolis, Ind.



The Earning Power of a DOLLAR
Proper Construction Gives Practical Results

A good Non-Ball Bearing Shaper today is worth to the user less than half of what it costs to manufacture it, because the earning power of the money expended is low compared with the earning power of money paid for a Buss Ball Bearing Machine. Our guarantee is 30 to 50 per cent. increased capacity, with less than one-half of ordinary Shaper expense (backed by 100 per cent. of our Ball Bearing Shapers in use today); because we have the ideal construction to get practical results from High Speed Ball Bearings. Time of adjusting, and spindle wear; **none**; power and belt bills more than cut in two.



No. 8 Shaper, Weight 2650 lbs. Net

Buss Machine Works, Holland, Mich., Grand Rapids, Mich., Chicago Branch: 117 N. Canal Street

Canadian Representative: **A. R. Williams Machinery Co., Toronto, Can.**

-Duplicate our last order for Marietta Stains and fillers. They are the most satisfactory wood finishing materials we have ever used.

Yours very truly,
A. Manufacturer

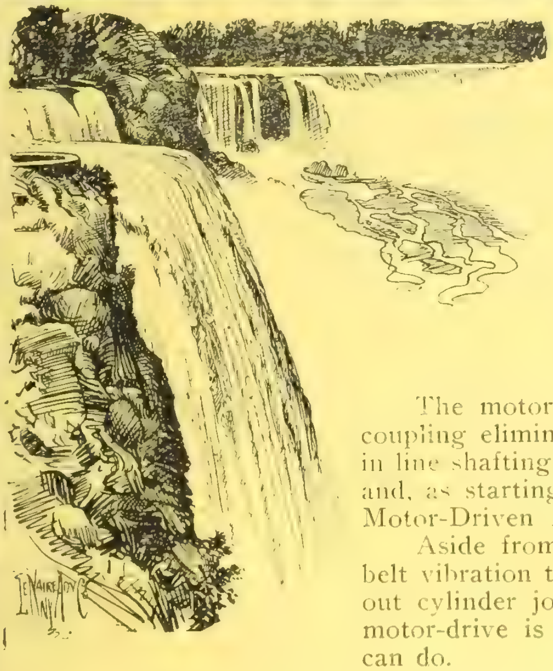
P. S. Your new Non-fading Mahogany Stain was a revelation to us.

Sample panels sent on request.

THE
MARIETTA
PAINT & COLOR CO.
MARIETTA, OHIO.

Volume Fourteen TORONTO, APRIL, 1914 Number Four

Canadian Woodworker



25% of the power you use in driving a planer can be saved by installing

A Whitney Motor-Driven Single or Double Surface Planer

The motor is connected directly to the cylinder by a perfect flexible coupling eliminating belt slip and the great loss of power through friction in line shafting and countershafts. The power is applied where it is wanted and, as starting and stopping is easy, power cost stops when the Whitney Motor-Driven Planer is not actually producing.

Aside from lower operating cost, the results are better. There is no belt vibration to contend with, no belt pull to spring the cylinder and wear out cylinder journals and boxes. The surfacing done on a Whitney with motor-drive is smoother and more uniform than any belted-type machine can do.

A word or two on a postal to us will bring you complete information. We will suggest, if you like, an equipment of square cylinders with two or four knives or round cylinders carrying four thin, high-speed steel knives, sectional rolls and steel sectional chip breakers or flexible steel chip breakers and other features that make Whitney Planers particularly adaptable to your planing. WRITE.

Baxter D. Whitney & Son, Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives; Henry Kelly & Co
26 Pall Mall, Manchester, England

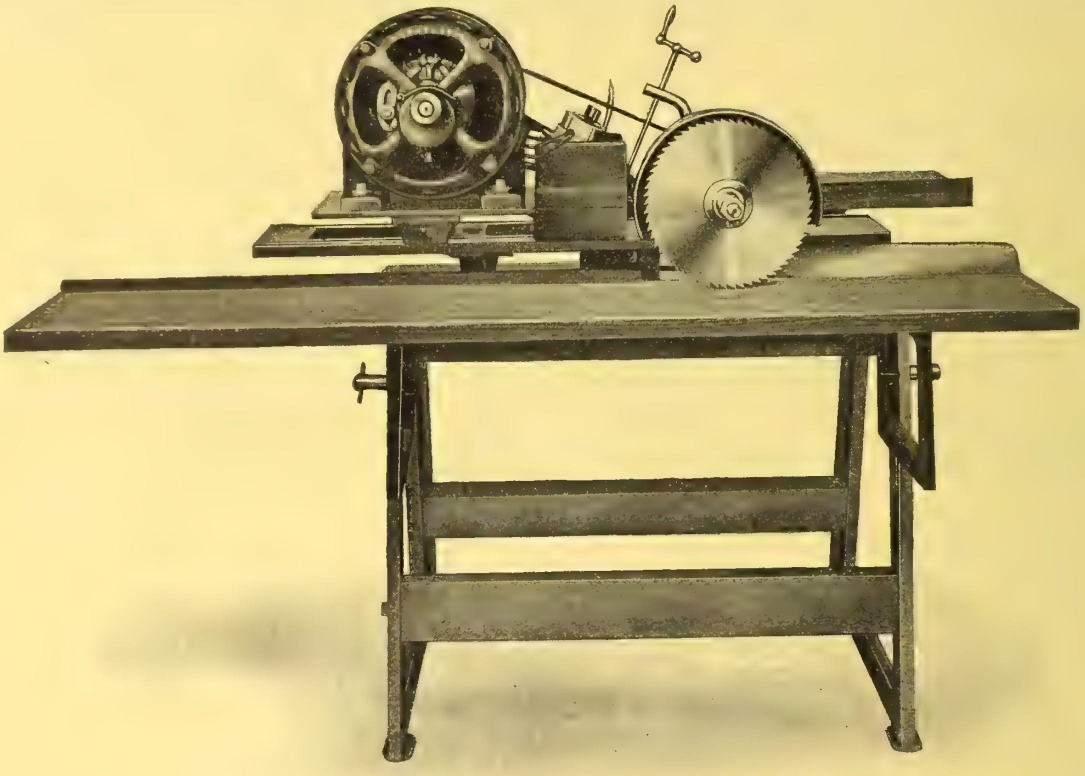
Alphabetical List of Advertisers, page 10

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders, Cabinet Makers, Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

Here are a few people who are using our machines :—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.

Perkins Vegetable Glue The Product That Sticks

Let Us Be Your Efficiency Engineer

We wish to impress upon manufacturers of veneered panels and built-up work the fact that every pound of material that enters into the composition of Perkins Vegetable Glue is personally inspected and that the finished product is ***absolutely uniform in quality.***

For this reason it is not necessary for our customers to maintain expensive laboratories such as many of the larger users of animal glue have installed to insure the quality of their adhesives. ***We do the glue testing for our customers and sell on quality.***

Originators and Patentees of Perkins Vegetable Glue

Covering a number of years, all classes of stock and the total numbers of factories where we have installed our glue, the very high percent of the business we now hold, proves that our glue and methods satisfy our customers.

This glue is ***applied cold*** and no heated glue room nor heated cauls are required in its use. There is no disagreeable odor to Perkins Vegetable Glue.

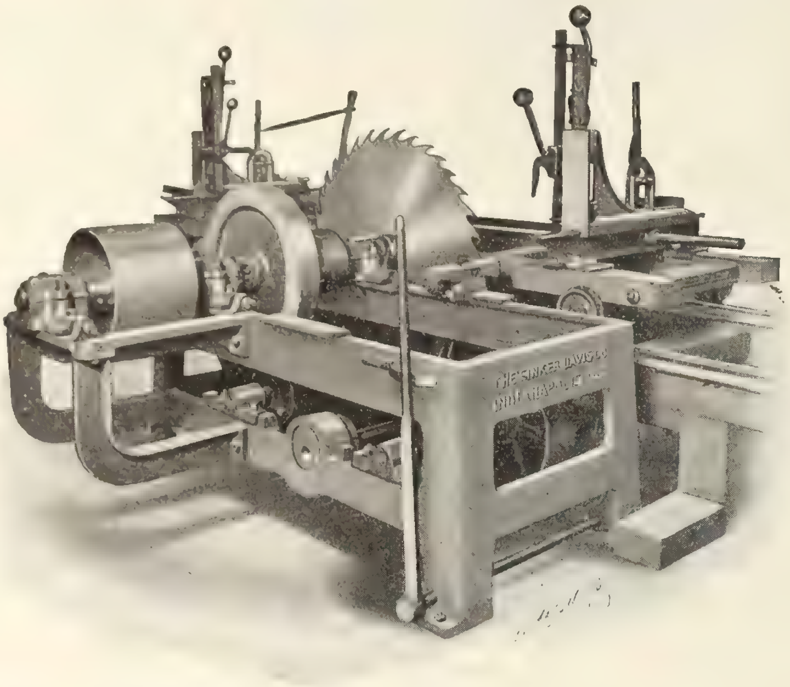
Let us tell you about it. Invite us to call and demonstrate. Write for testimonials from some of the leading built-up stock factories in America.

Perkins Glue Company

809 J. M. S. Building **South Bend, Indiana**

The "HOOSIER" Short Log Sawing Machine

As well built as our largest mill and does as good work.



The Hoosier Short Log Sawing Machine main frame is cast in one piece, which makes it very rigid and this main frame carries the mandrel and the feed works in self oiling adjustable boxes.

On account of the frame being rigid operator can use a very thin saw. The machine is practically self contained and portable and when shipped from the factory includes the track ways and track. We build blocks and carriages to fit all requirements for handling small logs and veneer cores.

For sawing veneer cores we make our improved and grip dogs that dog the cores in the ends and hold them rigid.

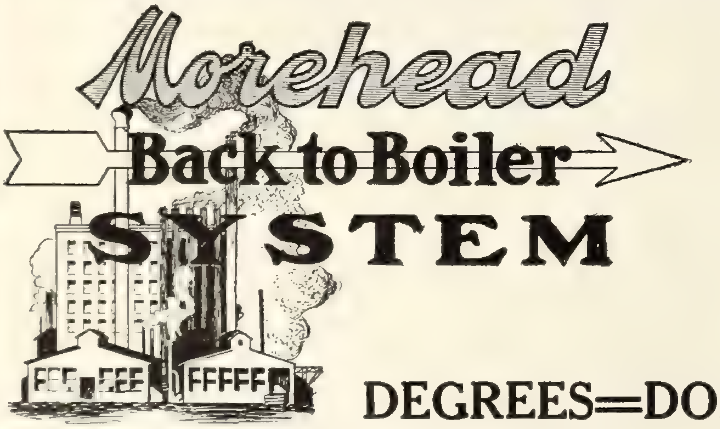
For sawing logs whether straight, swell butt or crooked we make a carriage with blocks opening 24-30 and 36-in. with independent knees and Knight's pony single or duplex dogs.

Machine will carry as large as a 54-in. saw and the machine will take care of logs up to 24-in. in diameter.

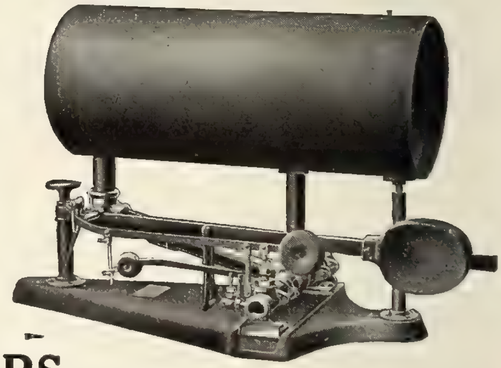
Write for further particulars regarding this machine and also regarding our New Hoosier Band Saw Mill and our new combination power and hand feed rip saw.

THE SINKER DAVIS CO. - - Indianapolis, Indiana

Manufacturers of the New "Hoosier" Band Saw Mill and All Steel Nigger Proof Head Blocks.



MOREHEAD RETURN TRAP



DEGREES=DOLLARS

Are you having trouble with condensation? Wasting steam in its distribution? If you are—and are the engineer who likes to be up on modern methods of eliminating waste you ought to know about the Morehead System. With a Morehead Trap installed in your steam system you can return the **hot** water, in your steam lines back to the boiler—without having to cool it to 212° and below, to accommodate your pump. The Morehead System puts the condensation right back into the boiler at 300° F. or higher—and without a pump. In this you are saving considerably on your fuel bill.

It is, therefore, a matter of good management and good judgment to install in your plant a Morehead Return Steam Trap System with its water, fuel and labor saving features. It is bound to appeal to the practical engineer because of the small number of parts and the ready access to them; the low cost of maintenance, the great capacity and thoroughness of its work. Furthermore, you may have the privilege of proving to your own satisfaction the truth of our claims—at our expense. Write us, stating conditions in **your** plant and have our engineers give you some helpful information.

CANADIAN MOREHEAD MANUFACTURING CO. Ltd., Woodstock, Ont.

Canadian Representatives: George W. Cole, Woodstock, Ont.; Robert S. Bickle, Winnipeg, Man.; H. E. Kirkham, Montreal, Que.
Robert Hamilton, Vancouver, B. C.

170

Morton Dry Kiln Instruments

Fig. 1 Shows Our

Troemroid Scalometer

Price $16.00

It is used for testing lumber to tell when it is dry enough to remove from the kiln.

It is absolutely accurate and will give you just the information you have been wanting. Very simple to use.

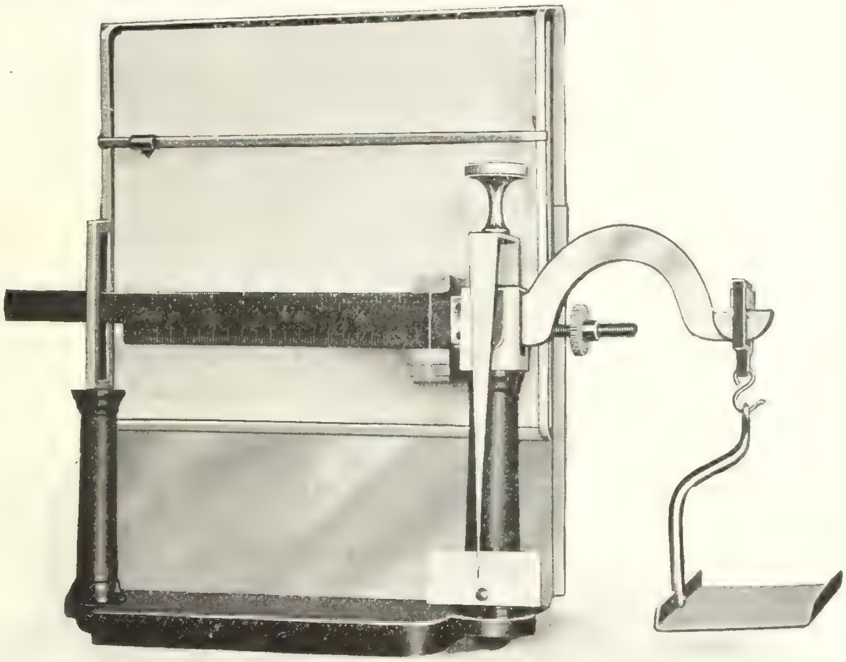


Fig. 1

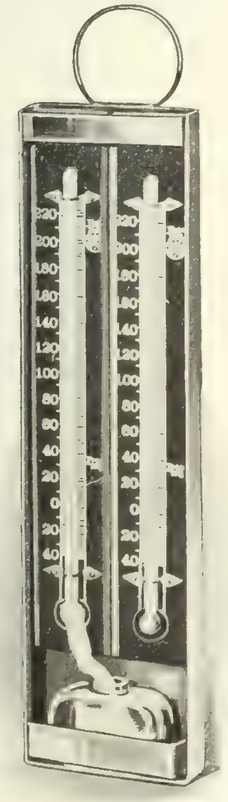


Fig. 2

Registering Hygrometer

Price $6.75

For determining the amount of humidity in the air inside of a dry kiln.

Special Price of

$52.00

F.O.B. CHICAGO

Will be made on these 3 Instruments if ordered together.

Write for our 2 Dry Kiln Catalogs C. and W.

Describing fully Fire Proof Kilns of the Progressive Type, Compartment Type, Pocket Type, Box Type.

A Few Users of these Instruments

Victoriaville Furniture Co., Victoriaville, Que.
Thomas Organ & Piano Co., Woodstock, Ont.
Meaford Furniture Co., Meaford, Ont.
Gerhard Heintzman Co., Toronto, Ont.
Canada Furniture Manufacturers, Woodstock, Ont.
Georgian Bay Shooks Mills, Midland, Ont.
Wm. Rutherford & Sons, Montreal, Que.
Gold Medal Furniture Co., Toronto, Ont.
Northern Planing Mills, North Bay, Ont.
George McLagan Furniture Co., Stratford, Ont.

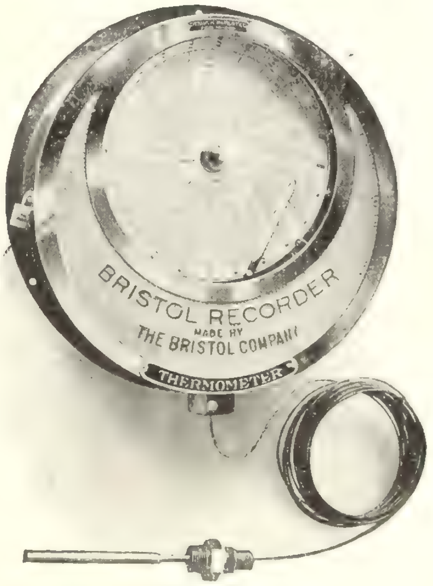


Fig. 3

Long Distance Recording Thermometer

Price $32.00

For keeping an accurate record of the temperature inside the dry kiln each hour of every day.

MORTON DRY KILN CO.

20 W. JACKSON BOULEVARD - - CHICAGO, ILLINOIS

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

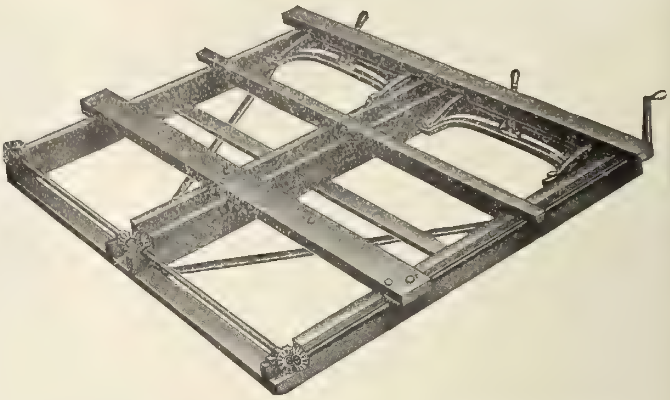
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

Dependable Factory Furnishings

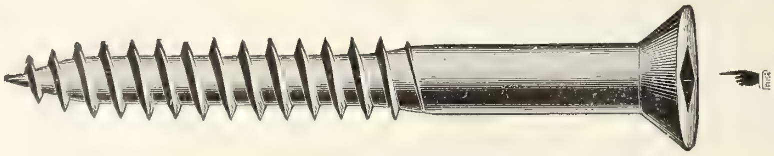
Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.

ROBERTSON SOCKET HEAD

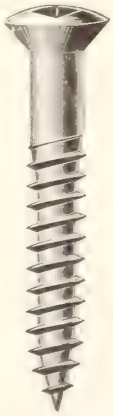
Wood Screws



See That Square Hole

Pat. Feb. 2, 1909

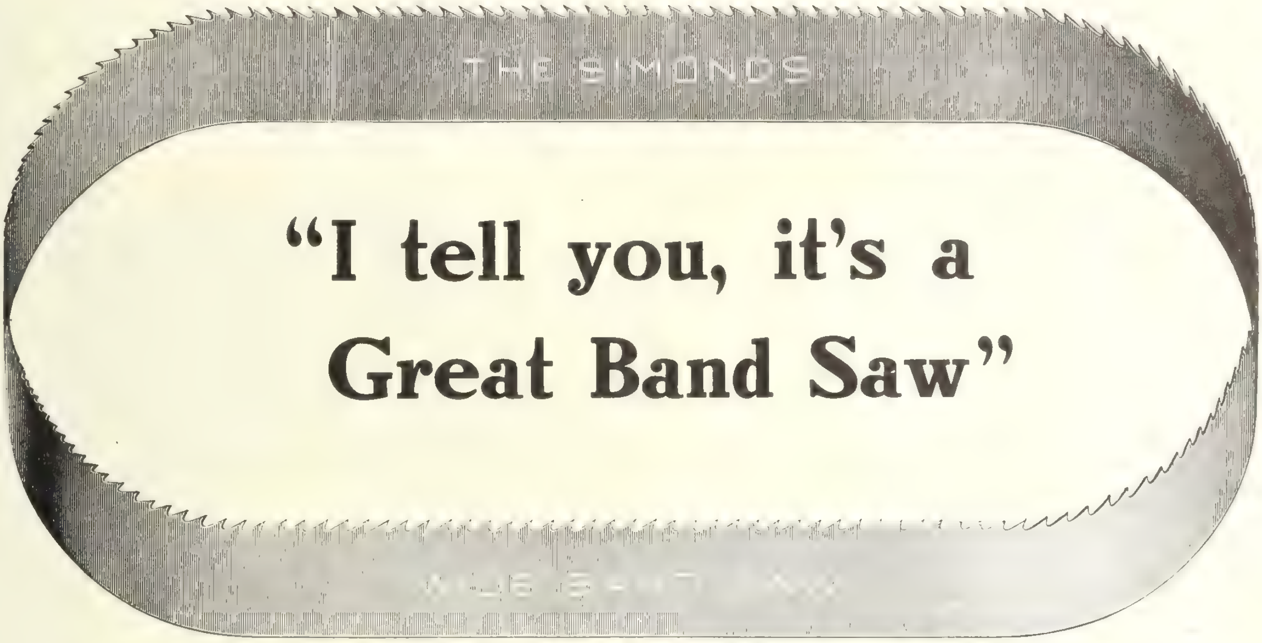
THIS IS A REAL WOOD SCREW



It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO



"I tell you, it's a Great Band Saw"

SIMONDS SAWS

The chief reason for Simonds Saws superiority is in the accurate method of manufacture as much as in the high quality of material used in the construction of the saws.

The grinding of Band Saws must be absolutely uniform throughout the entire length and width of the saw, no matter whether it be a Log Band or a Band Re-Saw.

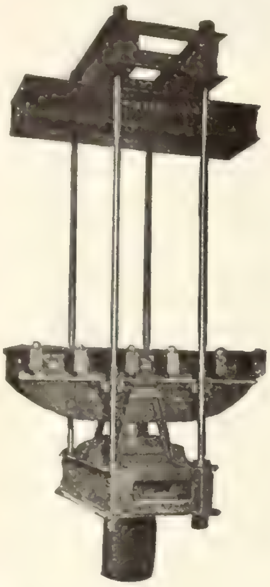
Simonds Circular Saws, Planer Knives, and Files are also made with the idea of giving the greatest amount of value to the user. Write our nearest office for full particulars regarding anything you require.

Simonds Canada Saw Co., Limited

St. Remi St. and Acorn Ave.,
Montreal, Que.

Vancouver, B.C. **St. John, N.B.**

Hydraulic Veneer Press



We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

Palmer's Glueing Clamps

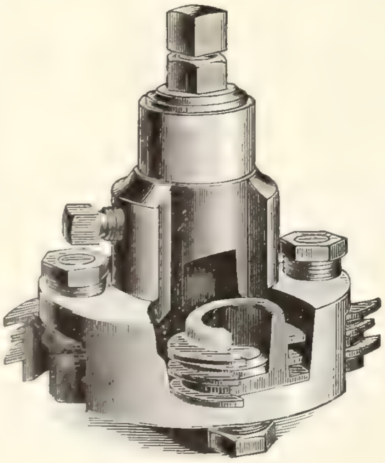
This time and labor saving device deserves a place in every woodworking plant.

Palmer's Glueing Clamps are quickly adjustable to any width and are easily and speedily handled.

Send for literature

A. E. PALMER & SONS
OWOSSO, MICH.

Double Matcher or Moulder Capacity



Double Ceiling Head

By the use of the Shimer Double Ceiling and Double Flooring Heads

100 per cent. gain in output by running your stock with double tongue and groove and then resawing, and all for an investment of only $40.94 and upwards.

The Bits on the Shimer Double Heads mark the saw cut line of division on the stock so that the sawyer can at once detect any variation of the saw and correct it as the board is passing through.

These Heads are no experiment. We have made them for years and they are in daily use in the best mills of this and other countries. You will find them very complete and practical tools, carrying the Shimer guarantee to do as represented or no sale.

We make a number of Heads for special purposes. For any design of material you get out in quantity let us give our estimate on the Head to do the work. Our prices are uniformly low—our goods of best quality.

SAMUEL J. SHIMER & SONS, Inc., Galt, Ont., Can.

Following are a few Net Prices of Tools which will be made to fit your machine and match your samples:

MATCHER HEADS

Figs. 22 and 23 with concave bit seats, without Bits	$24.30
Bits for Ceiling, the set of 8	10.40
Bits for Flooring, the set of 8	11.44
Bits for 2 inch Plank, the set of 8	13.04

JOINTER HEADS

Figs. 54 and 55, 4 bit seats each	$20.80
Jointer Bits 1¼ in. wide, each	1.30
Jointer Bits 2 in. wide, each	1.56

SHIP LAP HEADS

Figs. 38 and 39 4 bit seats to each Head, price net	$22.88
Bits for Jointing, 4	5.20
Bits for Rabbeting, 4	6.76

DOOR HEADS

Fig. 82, solid flange	$10.75
Fig. 84, with Expansion	13.35
Bits to work 1 in. to 1¼ Doors (4)	7.25

DOOR COPE HEADS

Fig. 83, upper and lower copes to fit any tenoner (set 2 Heads)	$12.90
Bits extra, 4	5.72

SASH HEADS

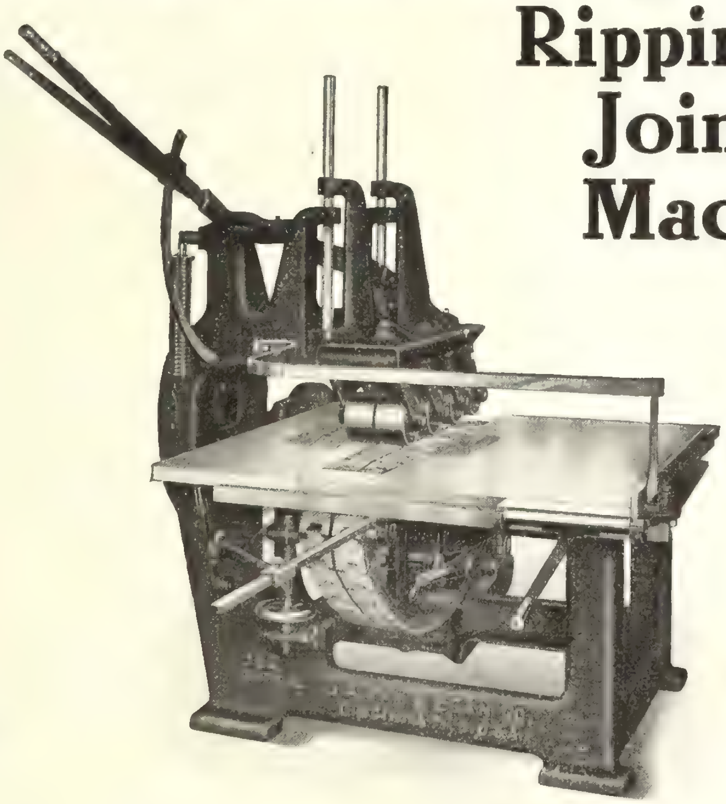
Fig. 86, solid flange	$ 9.75
Fig. 206, with Expansion	12.35
Bits extra to work 1 to 1¼ in. Sash	7.16

SAVE 1/8" to 1/4" OF LUMBER AND 33 1/3 to 50% IN WAGES WITH A

FAY-EGAN "LIGHTNING"

No. 362 Straight Edge Ripping and Jointing Machine

With Saw Cutting from Below



A No. 362

Makes short, narrow waste into wide boards. Rips, edges and makes glue joints in one operation.

Saves 1/8" to 1/4" of lumber on every joint.
Saves 33⅓ to 50% in wages.
No complicated parts to wear or break.
Can be operated by any machine hand.
Self-contained and takes up small space.
Saw cuts from below and is entirely enclosed.
Sawdust and slivers are drawn down and away from the machine—not scattered over the work and into eyes, ears, nose and mouth of operator.

Don't Wait Until Your Competitors Have 362's—SEND COUPON NOW

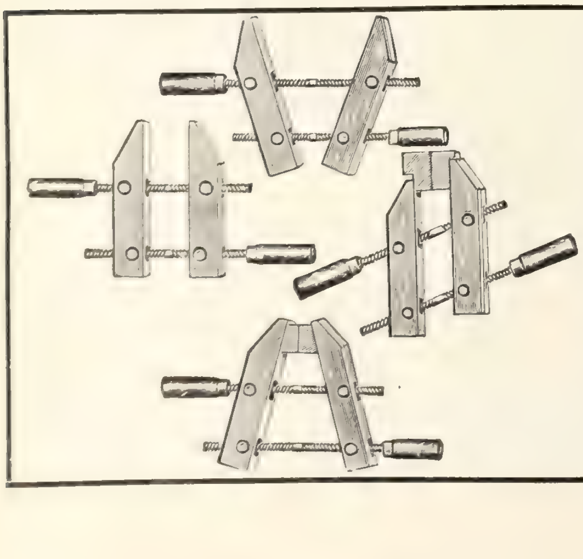
J. A. Fay & Egan Company

153-173 W. Front St., Cincinnati,
Ohio

J. A. Fay & Egan Co.,
Cincinnati, O.
Date ....
Please send folder of No. 362 Straight Edge Ripping and Jointing Machine
To ....
For ....
Address ....
City ....

Alphabetical List of Advertisers

Acme Veneer & Lumber Company	51
Adjustable Clamp Company	10
Andrews Company, A. H.	11
Archer Lumber Company	64
Atlantic Lumber Company	61
Ault & Wiborg Company	45
[illegible]	12
Billstrom, Nels. J.	12
Black Bros. Machinery Company	59
Black Lumber Company, Fred W.	53
Buffalo Tool & Supply Company	64
Buss Machine Works	71
Canada Machinery Corporation	16
Canadian Boomer & Boschert Mfg. Co.	71
Canadian Linderman Company	13
Canadian Morehead Manufacturing Company	4
Carborundum Company	15
Central Veneer Company	54
Chapman Double Ball Bearing Company	70
Chicago Machinery Exchange Inc.	59
Cincinnati Veneer Company	53
Clark Veneer Company, Walter	52
Curtis Machine Company	
Cyclone Blow Pipe Company	14
Dennison, Herbert, J. S.	57
Denny, Hilborn & Rosenbach	44
De Vilbiss Manufacturing Company	
Diehl Machine Works, G. M.	14
Dominion Mahogany & Veneer Company	55
Duhlmeier Brothers	67
Eagle Machine Works	45
Elliot Woodworker, Limited	2
Evans Lumber Company, G. H.	64
Fay & Egan Company, J. A.	9
Fox Machine Company	63
Francis Company, Chas. E.	12
Gorham Brothers Company	57
Goshen Veneer Company	53
Gotshall Manufacturing Company	62
Grand Rapids Hand Screw Company	6
Grand Rapids Veneer Works	71
Haughton Veneer Company	49
Hoffman Bros. Company	49
Hossafous, H. E.	53
Huddleston-Marsh Company	52
Huther Bros.	12
Jamieson & Company, R. C.	45
Keiths Limited	15
Kosse, Shoe & Schleyer Company	66
Licking River Lumber Company	65
Lightfoot, Stanley	57
Long-Knight Lumber Company	65
Marrietta Paint & Color Company	72
Meakins & Sons	44
Morton Dry Kiln Company	5
Nash, J. M.	11
National Process Company	67
National Securities Corporation	57
National Veneer & Lumber Company	52
Ober Manufacturing Company	11
Ohio Veneer Company	49
Ormsby Company, A. B.	
Palmer & Sons, A. E.	8
Penrod Walnut & Veneer Company	54
Perkins Glue Company	3
Perrin & Company	8
Powell-Myers Lumber Company	65
Pryibil Machine Company, P.	63
Reflector & Hardware Specialty Mfg. Company	59
Robertson Manufacturing Company, P. L.	6
Saw Mill Owners Sales Company	62
Schmidt Company	45
Scientific American	57
Scrim Lumber Company, W. G.	61
Sheldons Limited	14
Shiels & Company, Chas. F.	66
Shimer & Sons, Samuel J.	8
Sidney Tool Company	15
Simonds Canada Saw Company	7
Sinker Davis Company	4
Smith & Phillips Manufacturing Company	59
Smith Veneer Machinery Company	11
Spencer, C. A.	60
Standard Dry Kiln Company	67
Stevens & Jarvis Lumber Company	61
Stewart Greer Lumber Company	64
Strong Veneer Company	6
Thompson & Company, Lewis	52
Thompson Veneer Company, W T.	52
Thompson Hardwood Lumber Company	67
Timms, Phillips & Company	61
Toronto Blower Company	57
U. S. Steel Tank & Pipe Company	14
Walters & Sons, H.	63
Wardell Manufacturing Company	
Whitney & Son, Baxter D.	1
Wilcox & Knapp	61
Wood & Son, Fred	71
Young & Cutsinger	65



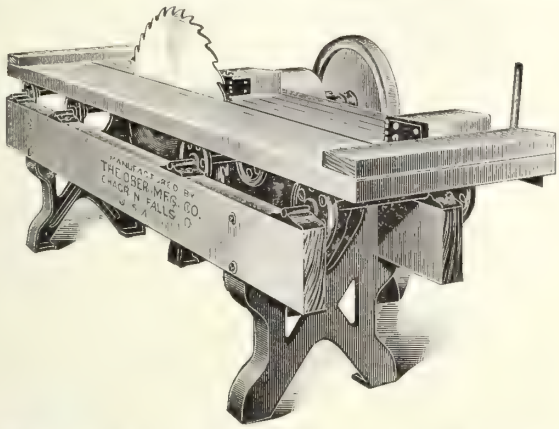
The Jorgensen Adjustable

is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company

215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng., Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.


MANUFACTURED BY
THE OBER MFG. CO.
CHAGRIN FALLS O.
U. S. A.

The Hand Feed Bolter

is the most PRACTICAL MACHINE for working short HICKORY logs into HANDLE BLANKS.

THE MACHINE SHOWN HERE IS ONE OF THE BEST.

Write for free catalogue No. 31 of **Bolting Saws, Rip Saws, Chucks, Turning Lathes, Sanders, etc.**

It will pay you to investigate THE HANDLE BUSINESS.

Information freely given on application.

THE OBER MFG. CO., Chagrin Falls, O., U. S. A.

Mr. Veneer Manufacturer and User—

Do you know what the

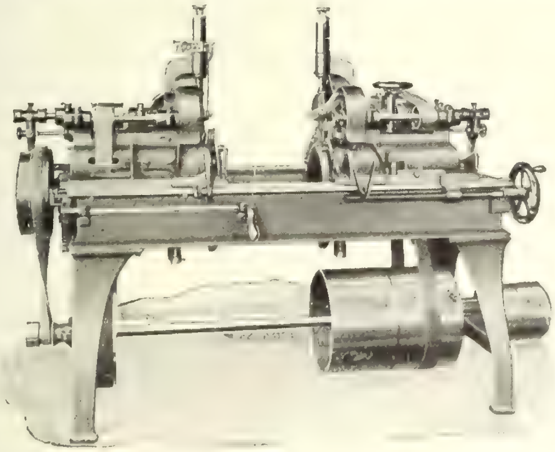
Smith Veneer Dryer

can do for you? We are installing dryers which meet every need and reduces your drying cost to the minimum. Ask any of our users. Anderson-Tully Co., Memphis, Tenn., are drying 7-32 gum in 50 minutes, bone dry ready for gluing and free from checks and splits or any discoloration. They have two Smith Dryers and are operating them from 60 h.p. boiler capacity. It costs you nothing to know all about the Smith Roller Veneer Dryer—entirely iron—will wear a lifetime—little up-keep expense—entirely successful.

Smith Veneer Machinery Company, Inc.
WATKINS, N.Y.

A New

Spoke Machine



This new machine will equalize one or both ends and chuck tenon for felloe in one operation. Capacity 2000 per hour.

J. M. NASH, Milwaukee, Wis.

Progressive or Charge Type

Condensing Lumber Driers

Designed and Constructed by

The A. H. Andrews Co.
Wabash Ave. and Morse St., Chicago

Are Selected by Those Who Know

BECAUSE:

Their *Temperature Regulation* is perfect and convenient.

Their *Humidity Control* is practical and easy to accomplish.

Their *Circulation* is positive in action and large in volume.

Their *Drying Time* is reduced to practical minimum, owing to constant and correct conditions of Temperature, Humidity and Circulation.

Their *Results* are ahead of all other Dry Kilns.

HUTHER BROS.

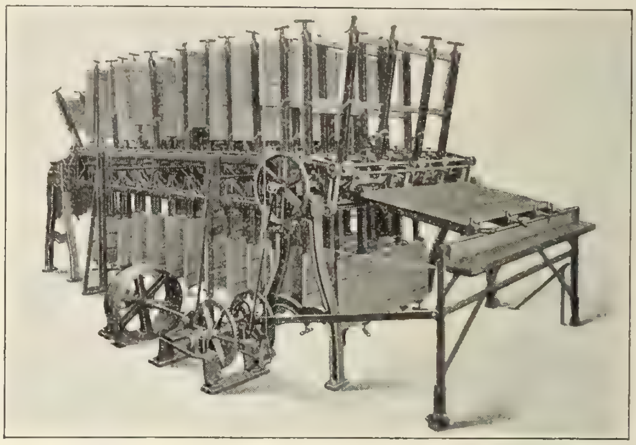
Patent Dado Head

PERFECT GROOVES

Can be used on any circular saw mandrel, and will cut perfect grooves, with or across grain. If not satisfactory, return at our expense—Simple adjustment—no screws. Write for our latest illustrated catalog.

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

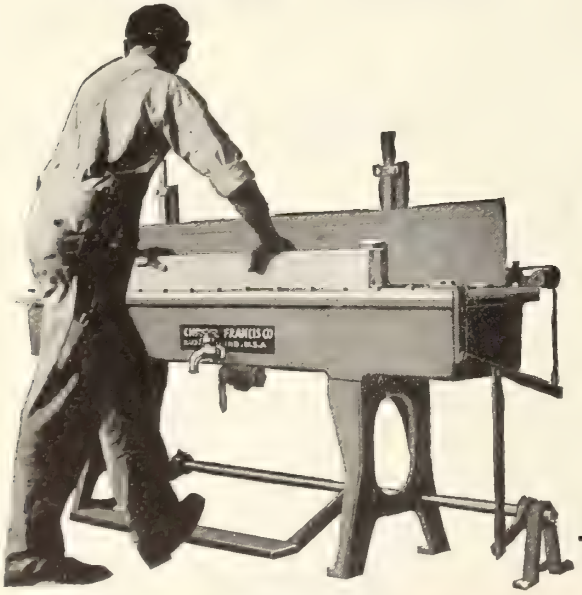
Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

Gluing Joints



A NEW WAY
A FASTER WAY A BETTER WAY

Whether for gluing thick stock, long or short (straight edges or shallow tongue and groove)—or for taped edges of face veneer, it will pay you to investigate this machine.

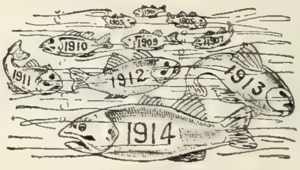
Panel plants, Furniture, Piano and other manufacturers are enthusiastic over it.

CHAS. E. FRANCIS CO.
Specialty Manufacturers of Glue Room Equipment.
Main Office and Factory: Rushville, Ind., U.S.A.

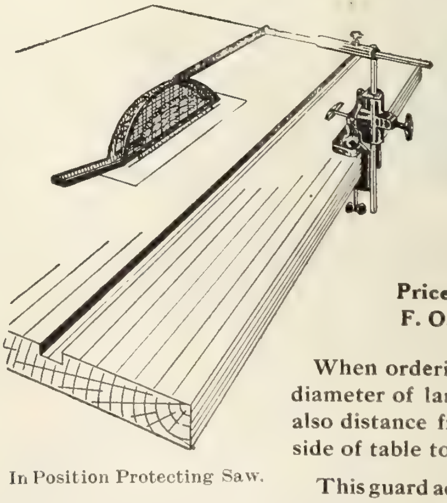
BASS BROS.

Manufacturers and Jobbers

Safety Appliances



82 Walker Street, New York



"WIRE HOOD" CIRCULAR SAW GUARD

Model B
Table Attached

Price $10.00 Net
F. O. B. Factory

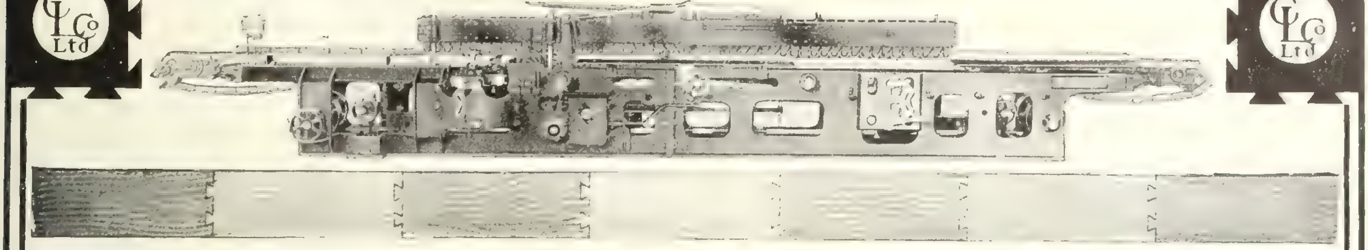
When ordering always state diameter of largest saw used, also distance from right hand side of table to saw.

This guard adapted for heavy table, has a range of 26" from right hand side, is equipped with Wire Hood for saw 16" in diameter and under.

In Position Protecting Saw.

Complete Safety Device catalogue, **"To Protect Yourself Protect Your Workers,"** sent on request.

Splendid propositions for "Live Wire" agencies.



The Linderman Dovetailer and Its Users

Twenty-nine of the Leading Progressive and Successful Canadian Factories, manufacturing furniture and kindred lines by the most efficient and economic method, who will frankly and willingly, upon receipt of request from you, tell you of the many advantages and economies they are receiving by its use, are :—

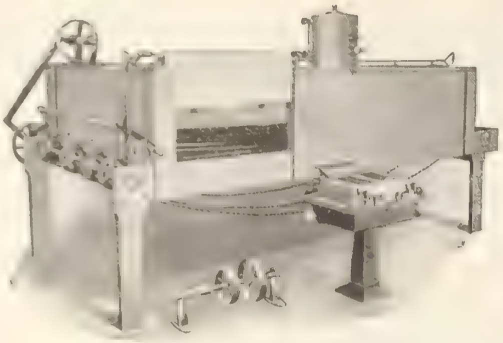
The Knechtel Furniture Co.,	Hanover, Ont.
The Knechtel Furniture Co.,	Walkerton, Ont.
The Knechtel Furniture Co.,	Southampton, Ont.
The Canada Furniture Co.,	Woodstock, Ont.
The Canada Furniture Co.,	Wiarton, Ont.
The D. Hibner Fur. Co.,	Berlin, Ont.
Peppler Bros. & Co.,	Hanover, Ont.
Krug Bros. & Co.,	Chesley, Ont.
Chesley Furniture Co.,	Chesley, Ont.
Durham Furniture Co.,	Durham, Ont.
Goderich Organ Co.,	Goderich, Ont.
Meaford Mfg. Company,	Meaford, Ont.
North Amer. Bent Chair Co.,	Owen Sound, Ont.
Globe Furniture Co.,	Waterloo, Ont.
Can. Office & School Furniture Company,	Preston, Ont.
H. E. Furniture Company,	Milverton, Ont.
National Casket Company,	Toronto, Ont.
Beach Furniture Company,	Cornwall, Ont.
Victoriaville Furniture Co.,	Victoriaville, Que.
Eastern Twps. Furn. Co.,	Arthabaska, Que.
J. W. Kilgour & Bro.,	Beauharnois, Que.
Dominion Furn. Mfg. Co.,	Ste. Therese, Que.
St. Lawrence Furniture Co.,	Riviere-du-Loup, Que.
W. F. Vilas,	Cowansville, Que.
Singer Mfg. Company,	St. John, N.B.
Windsor Furniture Co.,	Windsor, N.S.
C. F. Czerwinski Co.,	Winnipeg, Man.
Western Mfg. Company,	Regina, Sask.
C. P. Ry. Co., Angus Shops,	Montreal, Que.

If desired, we can also give you addresses of fifteen other concerns who are using the Linderman Machine for work not so particular as the furniture line.

Can you afford, in the face of this evidence, to continue in the old unsatisfactory and uneconomic way?

Twelve to eighteen months' saving will pay for the machine in your factory. Ask us to prove it to you.

Canadian Linderman Co.
Woodstock - Ont.



Automatic Stock Heater and Conveyor

Your Glue Room

We are specialists for the Glue Room. We manufacture everything needed to make it complete. Our equipment is designed to give **Speed—Endurance—Economy**—and includes Glue Jointers, Stock Heaters, Patent Glue and Water Scales, improved Glue Heaters, Glue Spreaders and Glue Clamps, besides a complete line of Cutter Heads.

Tear out this page, put your name and address on the margin, mail it to us, and we will gladly send you our complete catalog.

The Diehl Machine Works

On the Banks of the Wabash **WABASH, IND., U.S.A.**

U.S. STEEL TANK & PIPE CO
CANALPORT AVE & HALSTED ST
CHICAGO ILL U.S.A.
ENGINEERS & CONTRACTORS
FOR
SHAVINGS & DUST
EXHAUST SYSTEMS
SLOW SPEED
COLLECTORS
AND
FANS
ETC

Maximum Service

Minimum Repairs

The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

(Patented)

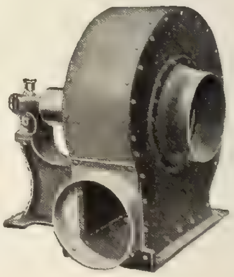
Cyclone Blow Pipe Co.

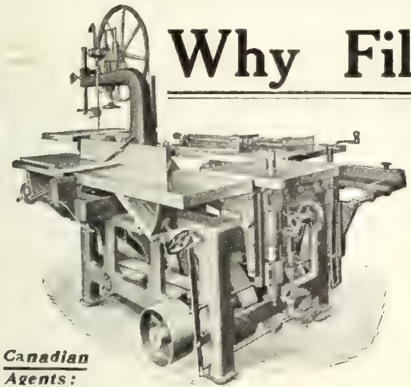
Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.





Why Fill Your Shop With Machinery?

The 1914 Model Famous "31" Universal Woodworker combines 16 machines in one and does 31 kinds of work.

Saves 50 to 100% in first cost, floor space, power, cost of installing and upkeep.

New Catalog No. 25 for 1914 tells all about the "31" and over 50 other money makers for Woodworkers. It's free.

THE SIDNEY TOOL CO., 250 Highland Ave. Sidney, Ohio, U.S.A.

Canadian Agents:
The A. R. Williams Mchy. Co., Toronto: Bournival & Co., Montreal: The A. R. Williams Mchy. Co., Winnipeg: The A. R. Williams Mchy. Co., Vancouver

Get the Most Out of Your Sanding Equipment

EVERY wood-working plant has considerable investment in the sanding department.

You will realize more on the men and machines—get more work, better work, more uniform results if you see that they use Garnet Paper and Cloth that cut clean and fast—show long life, and are uniformly coated with pure, hard, sharp, Garnet grain; in other words,

Carborundum Brand Garnet Paper and Cloth

The Carborundum Company
Niagara Falls, N. Y.

New York Chicago Boston Philadelphia
Cleveland Cincinnati Grand Rapids
Milwaukee

Keiths LIMITED

Reduce Insurance Premiums

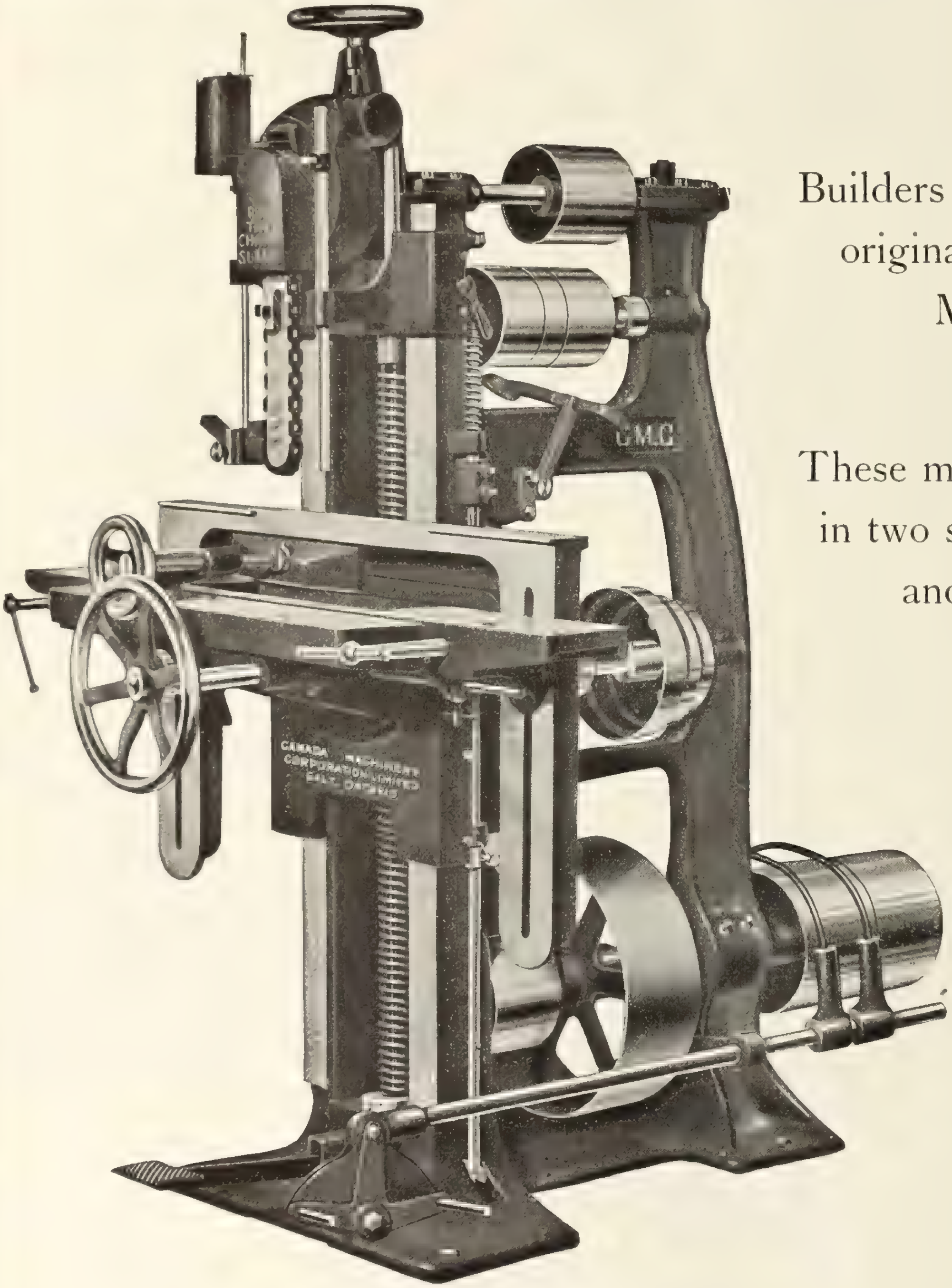
WILL YOU LET US SEND YOU AN EXPERT FREE OF CHARGE

to show you the best investment you ever made. Many Sprinkler Systems are paying their Owners 50% per annum return on the investment in reduced insurance premiums, and in addition are affording almost perfect protection against loss by fire due to interruption of business.

Head Office, 297 Campbell Ave., Toronto
Quebec Office, 707 New Birks Bldg., Montreal
Agents—Frick Co., Waynesboro, U.S.A.

Associated Automatic Fire Sprinkler

Chain Saw C.M.C. Mortiser


G.M.C
CANADA MACHINERY CORPORATION LIMITED GALT, ONTARIO

No. 541 CHAIN SAW MORTISER

Builders in Canada of the original Chain Saw Mortisers.

∴

These machines are built in two sizes—No. 551 and No. 541.

Our Bulletins, fully describing these machines, sent on request

∴

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Largest Builders of Woodworking Machinery in Canada

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring, woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.

Nicholls Building, Toronto
Phone Ade. 929

Vol. 14 April, 1914 No. 4

Workmen's Compensation in Ontario

EMPLOYERS of labor in woodworking factories throughout Ontario may well view with apprehension the Workmen's Compensation Act which the province is about to put through, **and should oppose it tooth and nail.** Objections to the Bill may be said to be legion, but a very serious one is that under certain circumstances it enables the employee, without regard to negligence, to obtain compensation to the extent of 55 per cent. of his former earnings, the payments to be continued if necessary for life, and in the event of death to continue to the widow or other dependents.

Of all trades the woodworking industry is one of the most susceptible to accidents. This the employers realize and after making every possible provision to prevent mishap to life and limb they are united in the opinion that the workman injured in their service while engaged in the proper performance of his duties should receive adequate compensation under a well-balanced business form of administration. The opposition is to a Bill which teems with anomalies and inconsistencies and suggests the possibility of much tiresome litigation arising out of the overlapping of the trades as classified under the Act.

It is understood that the government recognizes that the proposed measure has its shortcomings and that amendments will be made later, but this does not alter the fact that the Bill is likely to become law under the present status of affairs, neither does it compensate the employers for the injustice of having the Act administered by a Government-appointed Commission who will have such power as to enable them to interpret their own powers and sit in judgment upon their own decisions.

As it stands, the Act is one of the crudest attempts to legislate the vexed question of compensation ever made.

Safety and Sanitation in Woodworking Factories

TWO of the most difficult problems from the viewpoint of the factory owner are safety and sanitation; difficult because of the indefinite outlines which have been assigned them up to the present time, both by law and by common practice. The law demands guards around all moving belts, cutters, etc., insofar as they will not interfere with the operation of the machines. Then there arises the question of how much or how little of any machine it is necessary to protect in order to conform to the legal requirements. At present there is nothing approaching uniformity of practice in guarding machinery. Particularly is this the case with the belting directly on each machine. The ordinary single surfacer or pony planer, with the head belted from a countershaft below the floor, may be taken as an instance. In one factory such belts are found entirely enclosed in a wooden box with covered top over the cutter head pulleys. Another has merely a low wooden guard perhaps two feet in height insufficient to prevent a carelessly swinging hand and arm from being caught between the belt and the pulley. A third is that of a planer also belted from below, but with the belts absolutely without covering, the feed gears also being open except where covered by the manufacturer. The total enclosure box of the first example is at first sight the one to be preferred as it covers feed gears and pulleys. However, unless made and fixed with careful regard to the operation of the particular machine this type of guard will rather become a contributory source of danger. Arrangements have to be made to render the belting accessible for repairs, and to leave sufficient room to oil bearings. To give ready access to the belting it is necessary in most cases to make the whole of the guard removable, thus rendering the problem of fixing, when in position, somewhat difficult of solution, though not necessarily impossible. A couple of short bolts in the floor to pass through corresponding holes in the bottom of the guard, will generally prove sufficient to hold it in its location. Openings with hinged covers will make oiling easy. The suggestion as to better work without the guard is mainly prejudice, for of the variety of guards now on the market for all kinds of machinery, it is generally easy to find one which may be applied without curtailing the output to such an extent that the value of the factor of safety is minimised by reduced returns from the operation of the machine. It is only fair to concede that occasions do arise when it is expedient to remove guards, especially on circular saws used for variety work, but where there are inexperienced men or boys it is a safe rule that no machine shall be operated without guards unless the shop foreman has assured himself that the workman is competent to do the work with reasonable safety without a guard. With uniformly careful operation it is always possible to operate a machine without accident, but the unexpected not infrequently happens. Little pieces of wood may be littered around the floor every day in the year without getting in the position to cause someone to lose his balance and accidentally put his hand on the saw. In the case of the planer with unguarded belts in the vicinity, it would be likely to raise considerable trouble apart from compensation adjustments should a mishap occur owing to open belts found upon inquiry to have never been guarded. It would be interesting to discover who would be found to be most at fault, the owner for failure to guard the machine, or the factory inspector for not compelling the owner to use proper guards. Prevention is better than cure, for belting accidents often result in death.

Sanitation is a matter which is even more neglected than the question of guards. Some plants, it is true, are equipped with truly sanitary arrangements for the convenience of their work people, these generally being of the class that use up-to-date methods such as individual motor drives, etc. They recognise the all-important fact that men, just as well as machinery, give the best results when properly looked after. When speaking of sanitation it is our desire to emphasize not so much the presence or absence of conveniences, as the presence or absence of sanitary value in these conveniences. The bylaws of the locality in which the factory may be situated will require a certain standard of sanitation, but it is rarely that anything further is done. Want of uniformity is again at the bottom of the difficulty. There seems no standard of what constitutes the best sanitary arrangements for factories, and while some firms lavish money on most up-to-date arrangements others are content with so-called sanitary provisions which in reality are most insanitary. With regard to abnormal losses of working time in using sanitary conveniences, it is safe to say that much may be done to eliminate this difficulty, by arranging conveniences singly at different points around the shop. This saves much time in going to and fro, besides removing the opportunity for loitering. Safety and sanitation are two very important matters in all factories but which unfortunately are too seldom fully looked after. Much, we think, could be done by an interchange of ideas among employers and employees with a view to obtaining some uniformity of use both of guards and of sanitary arrangements. Of the many systems touched on there must be one that is best suited to each class of work, and it is clearly a matter the solution of which could be reached through co-operation.

A Contrast in Values

By Walt Mason

Old Hiram Hucksmith makes and sells green wagons with red wheels; and merry as a string of bells in his old age he feels. For over all the countryside his wagons have their fame, and Hiram sees, with wholesome pride, the prestige of his name.

He always tells his men: "By jings, my output must be good! Don't ever use dishonest things—no wormy steel or wood; use nothing but the choicest oak, use silver-mounted tacks, and every hub and every spoke must be as sound as wax. I want the men who buy my carts to advertise them well, I do not wish to break the hearts of folks to whom I sell."

The farmer bought those wagons green, with wheels of sparkling red, and worked them up and down, I ween. and of them often said: "You cannot bust or wear them out, and if you'd break their holt, you'd have to have a waterspout, or full-sized thunderbolt. The way they hang together's strange, they ought to break, but won't, most earthly things decay or change, but these blamed wagons don't."

Old Hiram's heart with rapture thrilled, to hear that sort of stuff; he worked and worked but couldn't build his wagons fast enough. And now he lives on Easy Street, most honored of all men who toddle down our village street, and then back up again.

Old Jabez Jenkins long has made blue wagons with pink spokes, and once he had a goodly trade among the farmer folks. With pride his bosom did not swell, he knew not to aspire, to get up wagons that would sell—that was his one desire. And so he made his wheels of pine, where rosewood should have been, and counted on the painting fine, to hide the faults within.

And often when this sad old top was toiling in his shed, a customer would seek his shop and deftly punch his head. Wherever Jenkins' wagons went disaster with them flew; the tires came off, the axles bent, the kingbolts broke in two. You'd see the farmers standing guard above their ruined loads, and springing language by the yard that fairly scorched the roads.

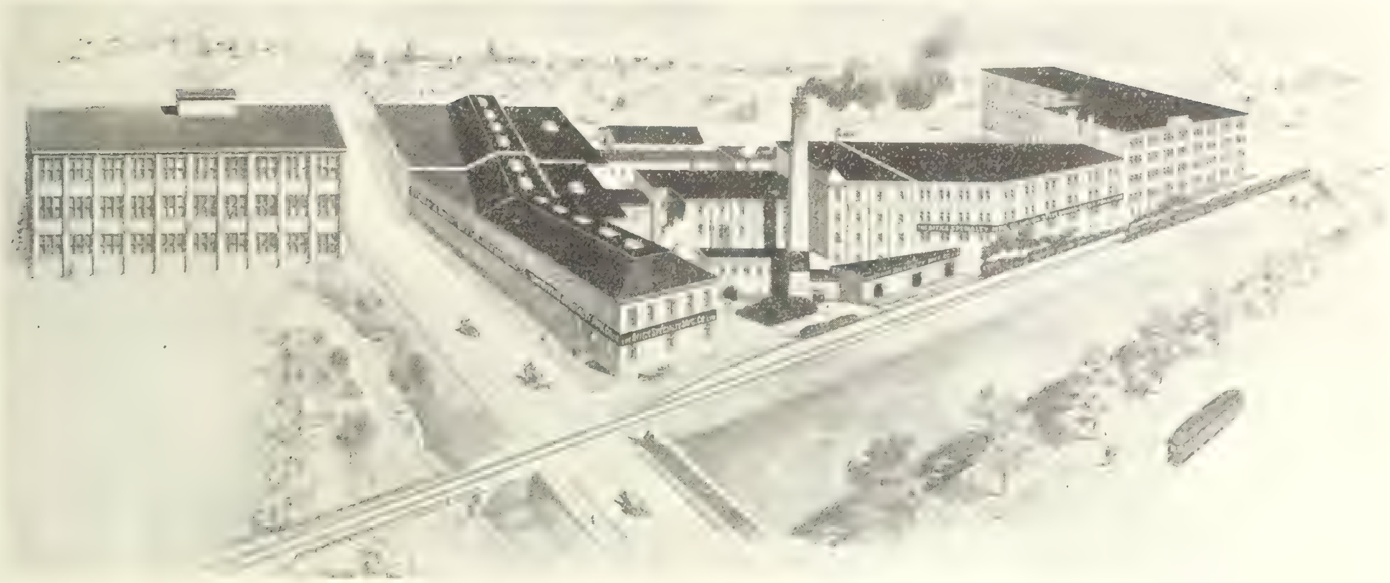
This Jenkins now is old and worn, his business is decayed; and he can only sit and mourn o'er dizzy breaks he made. Old Hiram's plan should suit all men who climb trade's rugged hill: Give value for the shining yen you put into your till.

A Forgotten Timber Trade

DIGGING among the mounds of ruined cities in the Euphrates valley, the excavators uncover logs of wood which formed beams and columns in palaces and warehouses. None of these ruins are less than 1,000 years old and some are much older. Some date back to the time of the Mohammedan conquest of Persia, and others long before. Particularly rich finds of that sort have come to light at Bagdad, Ctesiphon and Samaria. It recently occurred to investigators to examine those old beams somewhat carefully. It had been taken for granted that the wood had grown somewhere in the highlands north of the ruined cities and had been rafted down the Euphrates or the Tigris river. It has turned out quite different from that. The wood has proved to be teak, of species which grow in Burma and the Andaman islands, 5,000 or 6,000 miles distant from the place where it was used. Long voyages were necessary to bring it. The ships engaged in the trade sailed 300 miles or more down the Euphrates river from Bagdad, thence nearly 1,000 miles through the Persian Gulf, 500 miles through another gulf to the open sea, thence 3,000 miles across the Indian ocean, rounding the southern point of Hindustan, and thus reaching the Andaman islands, the nearest place where that species of teak grows. There is no known record of that old timber trade, but it unquestionably took place, and it is known to have continued during hundreds of years. Probably two or three years were consumed in a single voyage from the Euphrates to the teak forests and return.

Simplicity in a machine is admirable, but it is the most complicated machines that we marvel at just the same.

Every copy of a trade journal that comes into the workshop is an opportunity. The trade journal is the text-book of the business.



General view of Office Specialty Manufacturing Company's plant at Newmarket, Ont.

Manufacturing Methods and Equipment of a Large Office Furniture Plant at Newmarket, Ont.

(Staff Article)

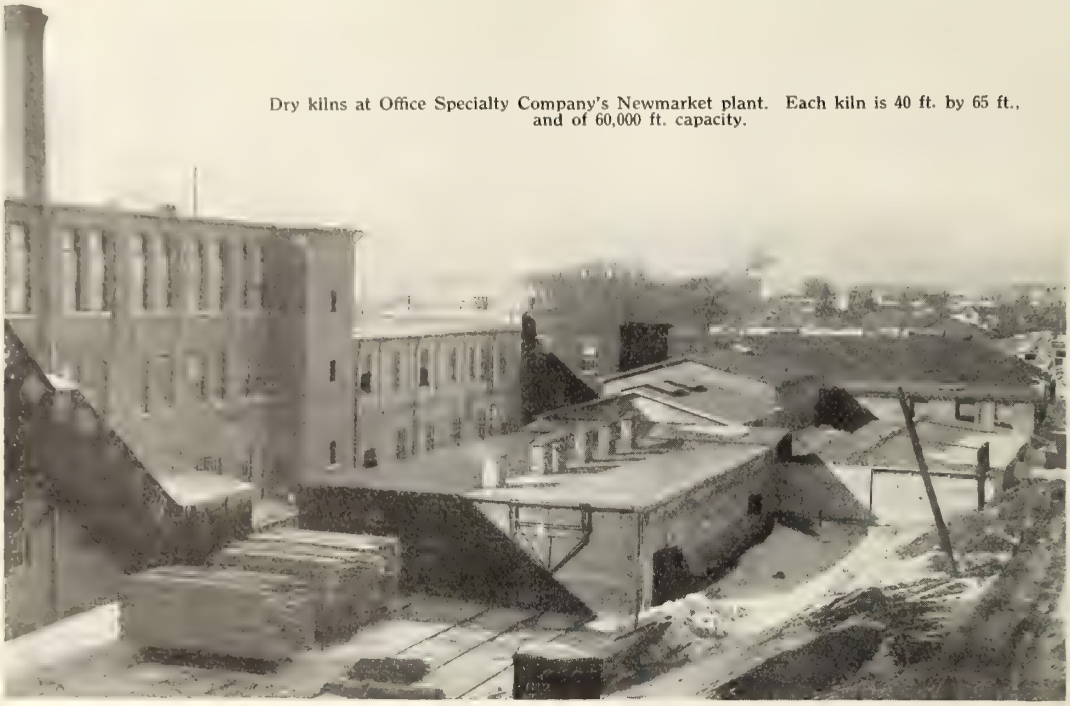
THE operations of the Office Specialty Manufacturing Company, whose special lines are office furniture and fittings, carry an exceptional interest to every woodworker in Canada, from Halifax on the Atlantic, to Vancouver on the Pacific. The products of this enterprising and up-to-the-minute firm are familiar in every part of the Dominion where modern office equipment is used. Like most other firms in the woodworking line the Office Specialty Manufacturing Company had its small beginnings. Its history as a Canadian organization opened some fifteen or sixteen years ago in a small office on Teraulay Street, Toronto. The company was re-organized and incorporated some time later, and under the new directorate the firm advanced rapidly in the manufacturing end. The problem of obtaining a suitable location for a factory was solved about twelve years ago when the firm purchased the old Novelty Works building at Newmarket, Ont., and started the manufacture of office fittings and equipment. Since that time important extensions have taken place practically every year. The original plant at Newmarket was very small compared with the extensive range of buildings which to-day occupy so prominent a position in the centre of the town. Some conception of the size of the factory will be conveyed when it is mentioned that the total floor space of the present buildings is 159,000 square feet. As the title of the firm indicates, office fittings of every conceivable kind are manufactured and an interesting feature in this connection is the fact that all woodworking fittings are duplicated as far as possible in steel, particularly in regard to sectional cabinets, letter file drawers, and other up-to-date office equipment.

The Canadian Woodworker had the opportunity recently of visiting the factory at Newmarket, and a record of the company's operations in the woodworking line will be of interest to our readers.

In raw material the firm carry about 65,000 feet of lumber. The principal woods in use are mahogany, quartered and grained oak, walnut, birch, beech, basswood, maple, elm, cherry and pine.

The buildings are of heavy mill construction, the various additions from time to time having been made in order to keep pace with the enormous expansion of the firm. The general layout has been the outcome of much judgment and foresight, the principal idea in view being the elimination of everything that would make for unnecessary duplication and consequent loss of time in handling. Off the main offices, Superintendent's and assistant Superintendent's offices, is situate the room in which the three-ply and wood stock parts are stored. Adjoining this is the woodworking machine room and the resaw room. A concrete subway under Timothy Street connects this section of the factory with a recently erected three-storey building of most modern design, which is used for the glueing, woodworking, and cabinet rooms, finishing and rubbing departments. At the extreme end of this latter building are the lumber yards. In the centre of the main factory a large four-storey building is used as a raw material stock room, filling and rubbing room, card index, box and paper department, and finished stock room. As will be seen by the accompanying illustration of the layout the plant takes in an entire block extending from Timothy Street to Water Street, apart altogether from the building to which access is gained from the subway. The section nearest Water Street is occupied with the metal working plant. This includes sections for metal cutting, metal working, post office, assembling press and stamping, tool and experimenting, metal finishing and japanning, shipping, etc. The location of the power house, wood storage room, dry kilns and lumber yards is also indicated in the lay-out.

The plant is equipped with two steam dry kilns of the Grand Rapids type, each 40 ft. by 65 ft. and of 60,000 ft. capacity. The lumber is run into the company's yards from a private siding on the Grand Trunk Railway which adjoins. It is then placed on the trucks and passed into the kiln, where it is subjected

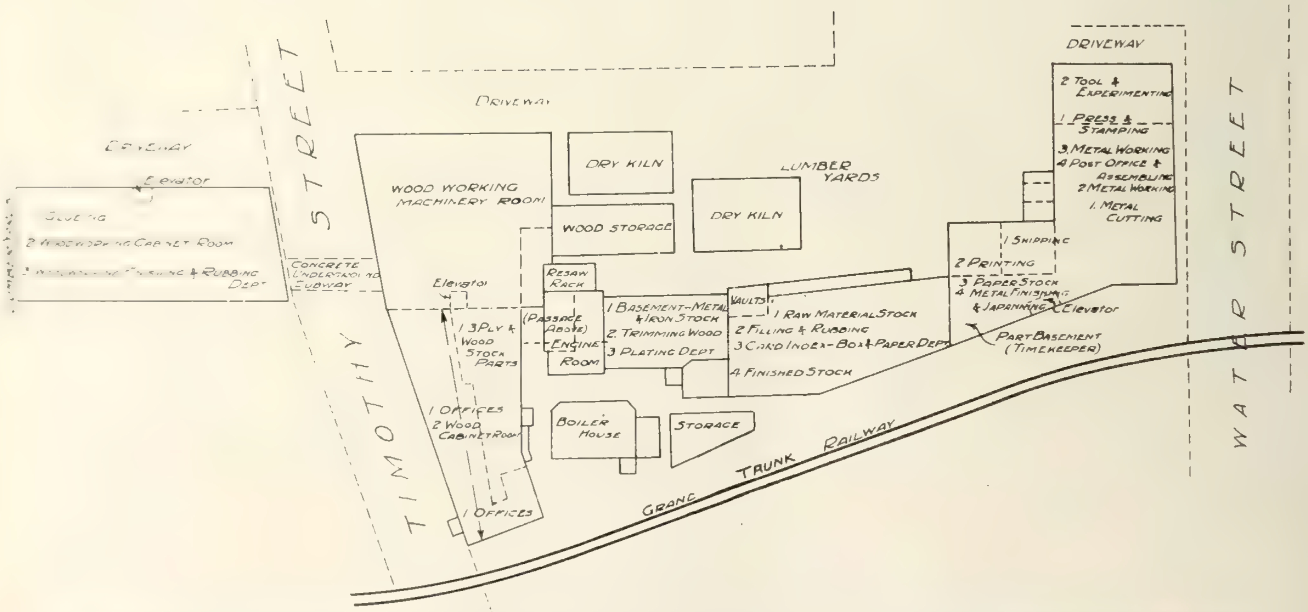


Dry kilns at Office Specialty Company's Newmarket plant. Each kiln is 40 ft. by 65 ft., and of 60,000 ft. capacity.

to a temperature varying from 150 to 170 degrees of steam heat. The lumber is kept in the steaming chamber for a period varying from thirty to forty-eight hours, until it is sufficiently softened and the tannic acid thoroughly removed. It is then carried further on to the drying chamber, after which it is ready for the factory.

When the lumber leaves the dry kiln it is placed in a wood-storage department adjacent to the kiln, and from here it is transferred to the woodworking machine room in quantities as required. It then passes to the sanding, staining and varnishing departments, and on completion of these processes it is transferred to the assemblying room preparatory to shipping. The lay-out of the factory is arranged so that not a single article goes back during the process of manufacture, and therefore no duplication takes place. Practically speaking, the rough lumber is taken in at one end of the factory and out at the other in the form of the finished article.

As an instance of the processes gone through in the manufacture of office fixtures it may be stated that the company manufacture from 10,000 to 12,000 fileboards a month, and each of these fileboards requires no fewer than nineteen operations to complete. In most woodworking factories dust is a troublesome



Lay-out of Office Specialty Company's plant at Newmarket. Note concrete underground subway connecting woodworking machinery room with new building, which is separated from main factory by Timothy Street.

element to contend with. Not so in the factory of the Office Specialty, as there is an almost complete absence of dust in the main woodworking and other machine rooms. This is accounted for by the fact that the machinery is operated by individual motors. The employees work under the most favorable conditions that could possibly obtain in a factory of this kind. On this floor all the controlling switches are located, and the twenty-six woodworking machines are driven from beneath.

In the manufacture of office furniture the firm is convinced of the superiority of dovetailing over nailing, consequently every drawer made in the factory is dovetailed, with all ends glued in and interlocked. This is claimed to be one of the strong points in the construction of their office fittings. There are two up-to-date dovetailing machines installed, the larger one being capable of taking twenty-four dovetails. Adjoining the woodworking machine room is the department which is used mainly for ripsawing the file-boards after glueing together.

Woodworking machinery room at the Newmarket factory of the Office Specialty Company. The complete absence of dust renders the conditions ideal for the employees.

Veneering and Glueing

Veneering is an important part of the factory's operations. For this process the firm have five veneering presses, three of which are capable of veneering a 10-ft. job. Another of the same type is at present in course of construction. Great importance is attached to the quality and condition of the glue used in veneering, and for this reason one man is given entire charge of the cooking of the glue. Apart altogether from the veneer department, glue required for use in any other process is also obtained from this department. Thus the firm secure complete uniformity in the standard of the work done. Of the veneers used three-ply is imported, but all table-tops are built in the factory. Desk-tops are built from three-ply to five-ply, according to thickness of tops required.

Finishing Veneered Tops

Passing on to the System Desk building, 80 ft. x 150 ft., this is a three-storey building provided with excellent lighting arrangements from all sides. All veneered tops receive three coats of varnish. If an oak finish is required then the top after being built up should be given not less than ten days before receiving its several coats of varnish. Where a mahogany top is required it should not be allowed to leave the varnish room in less than three weeks' time. In this respect it has been the firm's experience that customers occasionally display an unreasonable attitude in requiring the execution of orders for office furniture in such short time that it is impossible to bring efficient workmanship to bear on the necessary processes. The result is that if sufficient time has not been allowed for the varnish to dry and so produce a satisfactory finish, the inferior quality of the work turned out is not infrequently put down to the manufacturer, whereas the fault really rests with the consumer. In order to produce a satisfactory finish it is necessary that the first coat of varnish be absolutely dry before the second coat is applied. If this is done the consumer will certainly have a hundred per cent. better article than could be produced under other and less satisfactory conditions.

The question of waste is an important consideration in the factory, every precaution being taken to guard against unnecessary outlay in this respect. The percentage of waste in the various woods is carefully recorded from time to time and in this way accurate data is obtained as to the varying quality of the lumber. Mahogany is supposed to yield the least amount of waste and it is interesting to record in this connection that the firm have found by experience that the cheaper the lumber the larger is the percentage of waste. In fact the problem of waste is one of the many things in a woodworking factory which calls for careful checking.

The Finishing Chamber

Everything in the factory moves on trucks from the roughing out of the lumber and other processes to the finishing, assembling and shipping departments, no fewer than 140 trucks being continuously utilized around the works. Each truck will carry about 3,000 feet of lumber. The woods to be fumed are treated

Section of rubbing room in the woodworking plant at Newmarket.

This illustration shows a section of the varnishing room.

in various finishes, and for this purpose a vault of solid fireproof construction is installed. The process of fuming is an interesting one, a great deal depending on the shade required and also the character of the finish. For a regular finish the article undergoing the process is allowed to remain in the fuming chamber overnight. The fumes of ammonia, which are claimed by the firm to be the only genuine method of fuming, is the solution employed in the process. To obtain the best results in the finish it is absolutely necessary that the pores of the wood be as clean as possible so that the ammonia may work freely into the pores. Off the fuming department are the varnish rooms, which are up-to-date in every respect. As illustrating the precautions taken to secure the best results it may be mentioned that the benches without exception are covered with metal, a precaution which effectively prevents the stain from getting on the woodwork. Leading off the varnish rooms is the shipping department. Before shipping is determined on all finished work must first pass the scrutiny of the factory's inspector.

Other sections of the factory include the metal plant which, practically speaking, duplicates the processes employed in the woodworking end of the company's operations. Everything in connection with bank and other office fittings is manufactured on the premises, down to the making of the hinges. Records of all orders carried out during the last fifteen to eighteen years have been carefully filed, with the result that a duplicate of any particular order could be readily obtained. All kinds of finishes have to be matched at times, in addition to the regular stock finishes featured by the firm. In the steel work, electric welding known as "spot" welding, is substituted for riveting, several machines for this purpose being installed, and in addition electro, nickel, brass and copperplating presses. In the erecting room, situate on the next floor, the metal work is manufactured in much the same way as the woodworking. The process of graining is done in the graining department where the steel fittings are grained to resemble the appearance of wood. The next operation is the assembling and in this department everything is put together preparatory to shipping.

The enamelling department, like the varnish rooms, is absolutely fireproof, with cement floor and ceiling, iron supports and concrete abutments right down to the floor. For enamelling no furnaces are used, all the ovens being steam heated. The system in operation at this factory is the baking process, the five ovens being heated at times to a temperature of 250 to 275 degrees, while the minimum temperature is about 230 degrees. In metal work every individual piece of metal is treated with a heavy coat of enamel before it is put together, then all exterior work is given one coat and subsequently a third. The extent of the baking process depends largely upon the color of the enamel, but usually two bakings a day are obtained.

Power is supplied to the factory from a 200 h.p.

Assembling department, where the office furniture is finally fitted.

Room in which the japanning process is carried on.

Bench room at the plant of the Office Specialty Manufacturing Company, Newmarket, Ont.

Goldie & McCulloch engine, developing 2,000 volts a.c. current, 60 cycle, which is transformed down to 550 volts for operating the individual motors throughout the plant. Of these motors there are forty-one of different types throughout the factory. For the lighting system 110 volts of the current are distributed over about one thousand lights in the factory.

The glue used in all parts of the premises is heated by electric current, thus securing greater uniformity of temperature than would be possible from any other system of heating. Steam power is supplied from two high pressure boilers each of 150 h.p., and in addition there is a 90 h.p. engine directly connected with a one thousand light generator which is of direct C. current, 60 cycle. The company have also town connection for electric lighting which can be distributed throughout the entire factory at a moment's notice. The latter is the a.c. current, 125 cycle, ensuring a supply of three different sources of current practically throughout the entire factory on the same wires. This important arrangement was made under the personal supervision of the company's own engineering advisers. By a suction process all shavings and dust from the woodworking section of the factory is drawn through pipes direct to the power house and taken automatically into the furnaces. Two artesian wells

Erecting room, where the office furniture is put together preparatory to shipping.

are located on the premises for supplying the boilers, these having a capacity of eighty thousand gallons.

The machines installed in the Office Specialty Company's factory include two 36-in. single cylinder planers of the Whitney type; three 2-spindle shapers; one power and hand-feed jointer; one 3-cylinder sander and one 2-cylinder sander by the American Woodworking Machinery Company; one Bovlkz carver; one 8-ft glue jointer and one multiple spindle boring machine by the Fay & Egan Company; one single head tenon machine of the Jackson Cochrane type; one double head tenon machine and one power feed ripsaw from the American Woodworking Machinery Company; one spiral belt sander by Schimmel & Reid; one 10-ft. metal power shears by the G. H. Ohl Company, Newark; several 8-ft. cornice machines by J. M. Robinson Company, Cincinnati, Ohio; several Barries & Petrie drills; three Henedy & Bertram lathes; one McGregor Gourlay shaper; one plating dynamo of the Wells type; two plating barrels; several rotary slitters by the J. T. Robinson Company, Hyde Park, Mass.; two roll-top drop hammers; several McGregor & Gourlay stamping presses; five Gordon presses; two Harris presses and one Colts Armory press. In addition the firm have several machines made in their own machine shops, which are adapted to their own requirements both in the woodworking and the metal working plants.

Mr. Robt. F. Schmidt, Superintendent, Office Specialty Manufacturing Company, Limited, Newmarket, Ont.

The factory is equipped with the sprinkler system of fire extinguishing apparatus. A steam fire pump of the Underwriter type, capable of pumping one thousand gallons per minute is also installed. Seven hydrants are located in different parts of the building and one hundred and fifty feet of hose, as well as other fire-fighting equipment is provided, a volunteer fire brigade of sixty members being maintained from amongst the firm's employees.

General Office System

The general office methods in operation at the factory are a model which might be followed with advantage by other woodworking factories. The office counting room, situated on the ground floor of the woodworking building, takes care of all costs and purchasing departments connected with the factory. Here all the prospect work, drawings, etc., is done within the office, two draughting rooms being equipped for this purpose. An elaborate system of card filing contains a record of all raw material kept in stock. The foreman of each department is required to fill in all requisitions for material and the cost is charged up to the jobs. An inventory card system keeps check of the stock room by which means a perpetual inventory is obtained and the firm knows precisely at any time how much raw material is in stock. In all about 3,200 cards, or a card for every single item of raw material used, is handled. By this method such a contingency as shortage of stock is never allowed to take place. Usually about three months' supply of the principal items of raw material is kept in hand. The firm carry about $60,000 worth of raw material, but this is often increased in the busy season of the year. Another system worthy of note is that by which employees' time is checked up on the five minute principle. Time cards are numbered to correspond with the number of the order, about one thousand cards being handled every day by the time clerks When the plant is running at full pressure, as was the case last year, about 450 hands were employed, which means that the number of time cards handled increased to fifteen or sixteen hundred per day. Whenever a special order is received in the order department, a plan of the work is prepared in the draughting room and a blue-print is submitted so as to give the customer the opportunity of suggesting alterations. In the event of alteration in the plan, a revised blue-print is prepared and the order then passes direct to the factory.

Inter-communication System

About three years ago the firm installed an up-to-date private telephone system throughout the factory on the switch principle, by the Stromberg, Carlson Telephone Company, of Rochester, N.Y. All departments are numbered to correspond with the telephone number and there are thirty-eight telephones throughout the plant. In connection with the telephone system there is also an up-to-date signal arrangement used by the management for the shutting on and off of power, fire alarm, etc. The number of private telephone connections made throughout the factory during the average working day totals over five hundred. An up-to-date printing plant is also in operation in the factory.

The firm have an excellent system of keeping in close personal touch with the heads of the various departments. This consists of foremen's clubs arranged in sections, each of which meets at a stated time in the Superintendent's office for the purpose of discussing the various problems connected with each department which arise from time to time. The company also arrange occasional outings for their employees, and a scheme is also in operation for bringing out talent. "Use your brains and get a prize," is the injunction one meets with on passing through the various departments in the factory. Suggestions offered by employees in regard to the discovery of time-saving methods and so on are laid before the board of directors for consideration, and a prize is subsequently awarded to the most successful.

An efficiency chart is also in existence, and a scheme of compensation for foremen whose interest it is to see that the cost of production is kept as low as possible, is another feature of the works. For employees generally the bonus system has been established in eight departments and it is the intention of the directors to extend the scheme to all departments as an encouragement for the output of the best work.

The plant of the Office Specialty Manufacturing Company is claimed to be the best of its kind in Canada and its operations extend throughout the North American continent.

Saw Guards and Carelessness

IT is easy to guard a saw or a buzz planer, but it is not so easy to guard an operator against accident, for when a man will not use the machine guards which are provided what are you going to do about it? "I have tried all sorts of methods," says S. P. Swift, in Woodcraft, "and am about ready to give up in despair. I have tried the summary discharge plan, the fine and the premium plans, and each and all have failed; for many times the workman simply will not use the safety devices. There are many saw guards and guards for other machines on the market and the Patent Office Gazette shows each week from two to four more devices for the same purpose. Now as to the patentees, before any more guards are invented for pity's sake let somebody invent a guard or two which cannot be omitted—invent one which the workman must use. If that is done the inventor will deserve the thanks and patronage of the entire woodworking fraternity.

Figure and Color in Wood

THE figure of wood is determined more by the characteristic grouping and direction of the fibres than by any difference of color. The transverse surface of an oak log exhibits circles; the longitudinal surface cut through the center of the log, parallel straight lines; and the obliquely cut surface, parts of ovals; but few, if any, trees are to be found either exactly perpendicular or straight. Although these three surfaces show a general disposition to the figures described, especially when polished, very little bend and twist in the tree disturbs the regularity of the fibers, and adds to the variety and ornamentation of the wood. A longitudinal section through the center of the log is the hardest and most diversified, because in it occurs the zone of greatest density. The first and last layers of growth are presented in the same plank, but the density and diversity lessen as boards are cut further from the axis.

Curls are formed by the filling in of the space between the forks of the branches. The beautiful figure thus induced causes a log, say of mahogany, to be valuable in proportion to the number of curls it contains. There is great competition in the large markets for such logs, and prices which seem astonishingly large are sometimes paid for logs known by timber merchants to contain what is known as curl grain. The curl is generally shown on the outside, and there is always a possibility of there being interior ones as well, which do not show on the surface.

Figure is produced in a number of ways. One of them is by means of numerous small branches which the parent stem sheds during early life. These fail to penetrate to the exterior, and are covered over by the more vigorous deposition of the annual rings.

Don't forget that if you are only a one-cylinder man you've got no business trying to run a six-cylinder business.

Removal of Dust, Chips and Shavings

The ventilation of the subject of the removal of dust, chips and shavings from the machines and floors of sawmills, joinery and similar works has done nothing towards eliciting information, as, indeed, it never was intended that it should do anything of the sort—at least, as far as providing gratuitous information in the direction of pneumatic dust and the like collecting installation equipment was and is concerned.

The charlatan, when he essayed to advise upon the subject of electricity as motive power in the sawmill, made a choice mess of things, while the plumber, glorified or otherwise, has done, and is going to do, precisely the same in the case of exhausting dust, chips and shavings from the same.

Although much has been done by the author of these notes to illustrate the danger arising from the neglect to clear away dust and the like to a place of safety as the first step towards fire prevention in timber-conversion factories, the effect would seem to have been somewhat negatived by the failure of the interested, at any rate in not a few instances, to seek advice from the right quarters, or, if the assistance has been sought, to carry out the suggestions in the manner they were given.

We have heard and we do hear a tremendous lot about the abnormal amount of power absorbed by fans when employed for the purpose of refuse collecting, and, although it need not be supposed that anyone is going to be so stupid as to imagine that a 2 or 3 horsepower motor is sufficient to drive a fan capable of clearing a mill or works when the plant and equipment consists of 20 or 30 machines, making dust, chips and shavings as fast as it were possible, it would seem at once an abnormal state of affairs to be compelled to allow that an exhaust fan of suitable capacity should require 30 to 40 per cent. of the total power necessary to drive the mill. Rather might it not appear on all fours with something much more commonplace and lucidly illustrated, in an ordinary push bench, which, given everything in proper order, will take 8 to 10 horse-power to drive; but put an ill-fitted and dull saw on the spindle and a fool of a man to exert his entire force with a deal against it, and he will most successfully pull up an engine of two or three times that capacity.

The various species of furniture insects were described some time ago by Mr. W. N. Maxwell-Lefroy, the eminent British naturalist, to whom samples of fibres of different kinds were submitted by the Furniture Record. These samples have been carefully tested by Mr. Maxwell-Lefroy, who failed to discover in them any insects or traces of insects. Three samples of fibres were submitted: green Algerian fibre, black Algerian fibre, and cocoanut fibre. Each sample was isolated under the best conditions of moisture and warmth for the hatching and development of mites, and so was kept for over five weeks. Regular microscopical examination failed to reveal the development of any mites in any sample. This insect problem was revived in an important case some time ago in which the question of insects found in furniture was raised. Particular attention in this connection seems to have been devoted to Algerian fibres, especially the green variety. The problem is an important one and it is well that the trade should not form a wrong conclusion in regard to the test. The origin of the insects has still to be accounted for.

Practical Hints in the Art of Marquetry

Contributed by R. W. Hall, Toronto

(Concluding feature of a series of three articles inaugurated with the February issue of the Canadian Woodworker.)

HAVING now reached the stage at which the ordinary amateur is probably satisfied, to those who are still more ambitious and have mastered the instructions already given in our previous article, we will now pass on to the more difficult and interesting subject of introducing other material, such as brass, tortoiseshell, ivory, pearl and such like. Even wax takes a place here, and is a simple and interesting process, having this advantage over wood that any colour can be used as there is plenty of variety to be had.

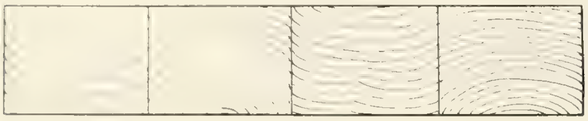
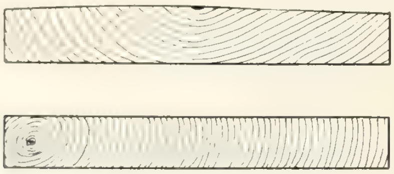


Fig. 1

Wax inlaying is a very old art but has practically died out and is only seen at rare intervals. Being a soft material compared with wood the designs should be confined to outlines and small spots not more than an eighth of an inch, and the wood used for this class of work should be hard and close grained and have a rubber of polish on the surface to prevent its being stained in the operation of running in the wax, which must be hot. The design should be cut with a V tool and be in a diaper or continuous pattern.

Where brass is introduced it is well to soften it by heating to a dull red and plunging it in cold water. The metal is then somewhat easier to cut, but at no time is it a pleasant task for the unskilled amateur. However there is not much of it used in conjunction with wood. In order to harden it again the brass must be hammered or rolled, but I have never found this necessary. In order to fix it properly to the wood a little venice turpentine may be added to the glue; this forms a good adhesive for metal to wood. To clean it off use a flat file, then pumice stone and a little oil and finish with fine glass paper—tortoiseshell and ivory are also used, but very sparingly owing to the rarity of the former and the expense of the latter. Ivory and ebony are used during the black-and-white period and that only on expensive furniture, while sycamore and dyed black veneer are more commonly used on the cheaper class of goods.



Figs. 2 and 3

The next in order is the pearl which excels all other materials, being one of the most workable and certainly one of the most beautiful materials for the decoration of almost any kind of wood. It is brittle but easy to work and can be cut with fine saws and filed to given shapes. As it is a very smooth substance it should be roughened on the underside so that the glue may hold. The pieces inlaid are pressed with caul and handscrew to clean off, and fine flat files must be used and finished off with finer glass paper. In cutting this material it is best accomplished on a piece of veneer glued down shortly before cutting so as to prevent chipping off the pearl. It should be filed up if necessary to fit the space for which it is intended, then dropped into a dish of hot water to release it from the veneer.

The Laying of Veneers

In the laying of veneers there are two kinds, knife cut and saw cut. The former are thin and are cut about thirty-six to the inch; the latter about twelve to the inch. The knife cut is sometimes used for outside work, but for work such as the inside of a panel it is used in order to draw against the veneer on the outside which is generally of superior quality to the saw-cut.

The first and most important thing to consider is the ground or core. The piece to be veneered, the best for this purpose, is Honduras mahogany, American walnut and sometimes oak for the best work, but American pine and whitewood are suitable for the commoner class of work. Woods of a resinous nature are not suitable for laying veneers on, nor is wood taken from the tree tops among the branches. The straighter and more even the grain the better and if near the heart of the tree it is often necessary to cut and reverse the growth in order to keep the work flat as in Fig. 1, which is one of the chief difficulties to contend with. Fig. 2 is a heart board to be veneered on one side. The first thing to do with a board of this description is to dress the heart side with an even camber, that is to say a slight curve as most heart boards have a disposition towards irregularity, as shown in the illustration. Having as much curve as is required it need not be damped on the reverse side as the veneer in drying will draw it almost straight. Take a piece that has been cut in the opposite direction (Fig. 3) which may be quite flat; dress any irregularity in the machining and teeth with the teething plane the whole surface to be veneered, then in order to counteract the drawing power of the face veneer, the reverse side must be damped to such an extent that the face side will become hollow for the time being. This is done by placing on wet sawdust overnight so as to absorb sufficient moisture. The face side may then be sized with thin glue size and when dry may be run over lightly with the teething plane to remove any specs or roughness. It is now ready

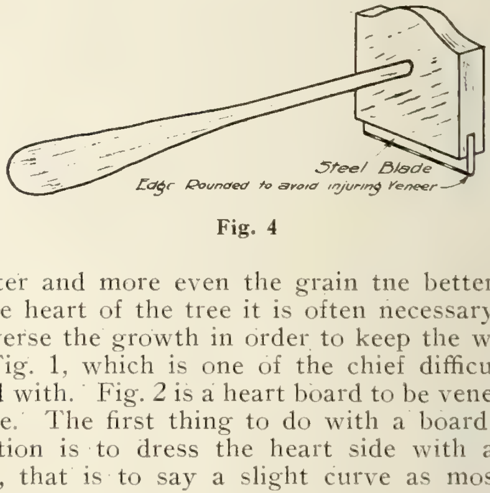
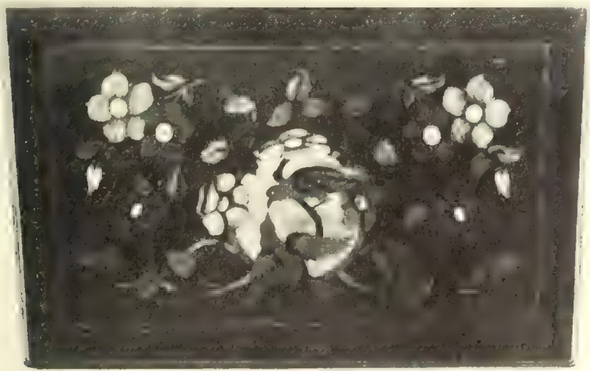


Fig. 4

for laying which may be done by rubbing with the veneering hammer (Fig. 4) or by cauls; if a small surface is required the hammer is very convenient. If the veneer is slightly damped on top and the glue properly heated, and the work done quickly a satisfactory job generally results. If a large surface has to be gone over, a flat iron must be at hand and kept hot enough to melt the glue under the veneer when required. Rubbing from the centre outwards in an oblique direction and tapping with the handle of the hammer will determine whether it is properly laid. If dull in sound this will denote that there is glue beneath it, therefore it must be heated with the iron and rubbed out when the sound will now appear hard and solid. The veneer must now be laid aside until thoroughly dry, carefully exposing the round side to the air until almost flat, when both sides may be aired. In veneering large surfaces the press and cauls are the most satisfactory; the cauls may be of wood but zinc or aluminium is better. They should be an eighth of an inch thick and not too hot as if the glue is roasted with the heat of the metal cauls it may cause endless trouble from blisters.

Inlaid table top, exhibited at Beith Arts and Crafts Exhibition, 1909, gaining bronze medal.



Top of complete table, embodying almost every hint in this article. Gained first prize at the Scottish Ideal Home Exhibition, Glasgow, also at the Edinburgh and Midlothian Show in 1909, and second prize at the Canadian National Exhibition, 1912.

When veneering on both sides, and especially when the core is composed of the softer woods, it is a good method to cut into small strips and rejoint as in Fig. 1, each joint running the reverse to its neighbor (as shown by the annular rings) dressing, teething and sizing as formerly. Yet another method is that which is termed five-ply which is of French origin and is extensively used on high class work. The core is first veneered on both sides, the veneer running across the grain of the core and the outside veneer running in same direction as the core. Being veneered on both sides the draw is equal, thus disposing of the damping operations and the loss of time in connection therewith. These must be stood in position to have both sides exposed to the air at the same time. Should they also show a tendency to go round, expose only the round side for a few hours. A little attention in this direction during the first two or three days will well repay the care bestowed especially when pattern veneering occupies the face. The discovery of blisters is sometimes made after the work has been cleaned off and sent to the finishing room, from various causes, one of the most prevalent being improper sizing of the surface. In many cases where piece work exists the surface is not sized at all. Another common cause, especially where machinery is used, is the presence of drops of oil from the shafting, etc., which penetrate into the wood. Scarcity of glue or the glue getting chilled before the warm caul is applied are other causes of blisters. As blisters will seldom lay down with heat, the glue having been rubbed out, it is necessary to cut them with a sharp knife at an angle so that one edge will overlap the other. Raise it up slightly, run in some fresh glue and rub down again, afterwards placing a piece of paper and a block of wood, covering a little more than the newly glued surface and allowing it to become thoroughly set before being cleaned off. Care must be taken not to go through round the blister as being thinner it is now likely to be below the surface of the other.

Having now reached the close of this series of articles I wish to say that if I have failed to make everything clear to the beginner I shall be pleased to answer, through the medium of Question Box, any query that would tend to enlighten readers of the Canadian Woodworker.

Veneering and Inlay Work

THAT the more extended use of veneer in mill and cabinet work is bringing with it an increased call for inlay work is pretty evident on all sides. It is a very natural order of things, too. Veneering leads to flat, smooth faces, and where these are large, the desire to beautify by breaking the monotony leads directly to inlaying as a proper thing.

We have it manifesting itself in connection with the smooth or flush-face doors, and we have it in large panels, and even in small ones, where the desire is to heighten the artistic effect. The inlaying goes with veneering just as naturally as fancy figure in the veneer face itself appeals to what we call the instinct for beauty. It gives the pleasing effect of varying lines and colors, without the objectionable features that attend carved work.

The progress of inlay work during the next few years will perhaps depend quite largely on the facilities for cutting out the spaces for it and for trimming the woods to be used in the inlay. There are signs of progress in this line, too, which indicate a concentration of attention on the subject that bespeaks progress. To reduce the cost of artistic inlaying is to put it within reach of a much wider field of uses, and if the same progress is made during the next few years in this work that has been made in some other lines pertaining to veneer-laying, it will likely bring with it a wonderful era in artistic effects through inlay work.

Satisfactory Methods of Operating the Single Surfacer

Contributed by Leonard Blake

THE single surfacer or planer would not at first seem to be a machine requiring any great skill to operate. Just wind up the table to the required mark, throw on the belt and put in one end of your wood, and the machine will do the rest. That is just the point, and there is no doubt in the matter, but the question is: what will the rest amount to when the board leaves the machine? Is one side perfectly smooth, without visible marks? Or are there waves across, or "railroad tracks" along the board? Perhaps part of the board comes out at the same end it went in, or even turns sideways in the machine. Yes, the machine does the rest, all right, but in these days of dear lumber it is always a good plan to decide beforehand just what the machine is required to do, and also to make sure that the machine will do what is required. Then it will be time to start feeding in the wood.

In the first place, of course, the knives have to be in the machine, sharp, and accurately set.

To take the matter of setting, there are two methods commonly in use, each having its merits, according to the personal ideas of the operator and also the peculiarities of the machine. Of four plants well known by the writer, two use the first method and two the second, so that it can be seen that opinion is pretty equally divided.

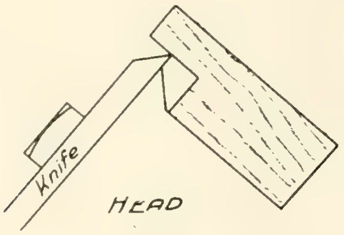


Fig. 1

The first method calls for the use of two hardwood strips, both planed to an equal thickness, and long enough to reach right through the machine. These are placed on the bed, one at either side, and the bed is raised till the gauge shows the same as the thickness of the strips. Then the knives are put on and secured by the end bolts, and each knife is brought out by lightly tapping the back till both ends of each knife touch the strips. When this has been attained tighten up all the bolts and remove the strips. Then run the strips through simultaneously so as to take off a light shaving. Feed one at either end of the knives and then compare them for thickness. If equal the knives are all right. Sometimes, when the knives are getting narrow owing to continued grinding, it is well to test the middle also, as it is possible to get the edge of a narrow knife considerably out of straight in bolting down.

The second method is quicker of operation, but it depends for its success on the relation of the center line of the cylinder to the face of the bed of the planer. If the two are parallel this method will give satisfaction. In this connection it may be said that the bed and the cylinder should always be parallel, but too often it happens that uneven wear takes place and is overlooked for some time, so unless the bed and cylinder are known to be in adjustment it is safest to use the first method.

To return to the point, however, a piece of hardwood is cut as in Fig. 1 with just a notch deep enough to give the required projection. After lightly bolting, the knives are tapped forward till just felt by moving the block. This method gives quicker results as there is not the necessity of continually turning the cylinder by hand, and it is easier to feel when the knives are projecting enough.

The adjustment of feed rollers is one of the most troublesome things connected with this machine; especially if there is a variety of work to be done by one machine. For wet, heavy stock the lower rolls marked 2 and 4 in Fig. 2 are raised a trifle to get more grip on the slippery surface. But if some thin panels are put through immediately after without readjusting the rolls, they would leave the planer rougher than when they left the resaw. For panels these rolls must be kept right down so that they only just touch the stock without raising it from the bed at all. These rolls should be adjusted with a straight edge long enough to touch both, and care should be taken that one end of a roll is not higher than the other, or the stock will be turned around in the machine and take the knives across the grain. This generally results in smashing the stock altogether, with danger to the feeder. By the way, how strange it seems, that so many feeders, after an incident of this kind, will bend down and take a sight from the front of the machine to see if all the wood has been thrown out. If it is necessary to do this it is only on the safe side to go around to the other end before getting in line of the feed.

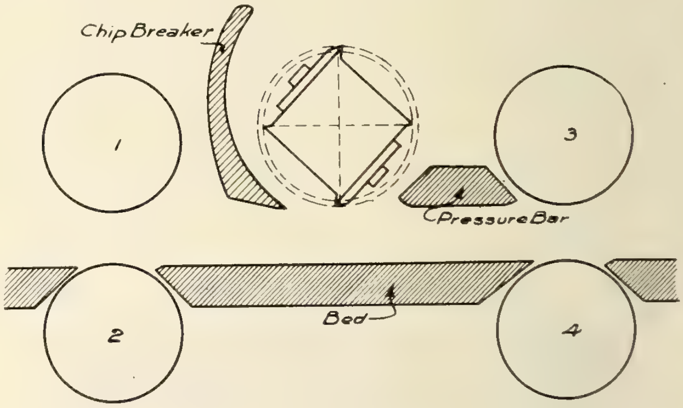


Fig. 2

Unequal weights on the top feed roll (No. 1 in sketch) are also responsible for giving the stock a twist in feeding in. See that equal weights at equal leverages are applied to both ends of this roll. Also avoid tipping the roll too high at one end by inserting a thick piece, as feed driving cogs are easily broken by this means. In the writer's own experience one planer had feed cogs broken twice in six weeks by this means, resulting in an idle machine for over a week each time, while waiting for new cogs. Pay attention also to the pressure bar, especially on wide, thin stock. If wide panels come out with waves near one edge the pressure should be increased at that side. Chip-breaker bolts should be watched for any signs of looseness, as in a mix-up between the chip-breaker and the knives results in much damage to the machine, even if the operator has time to jump clear.

Stock should always be fed with the object of wearing all parts of the machine evenly. With narrow stuff when there is no great variation in thickness, feed one piece at each side simultaneously, while if there is more variation, feed one by one, starting at one side and working across. If all the stuff has already been dressed one side, the machine can be kept full from side to side. Feed stuff hollow side down for easy feeding, and with wet or sticky lumber use coal oil freely on the bed. The sketch herewith is merely an outline to indicate which feed rolls are meant in this description and cannot be taken as a true sectional view of any surfacer.

One thing may be said in conclusion, and that is, not the least important, namely, keep the shifting gear of the table free from chips and dust. It is quite common to find planer beds that require an enormous expenditure of energy to lower them more than half of their full travel, simply on account of guides and gears choked with chips. A quarter of an hour per week spent in cleaning this machine would no more be lost than on the rest of the plant.

The Care of Extra Thin Band Saws

WITH timber growing scarcer and scarcer every day, and the prices of lumber going higher and higher correspondingly, the motif of the future is going to be thinner saws, writes Hapsburg Liebe in Berlin Quality. Now, personally I have never liked extra thin saws, but that fact is not going to keep me from telling the truth about the future. As I started out to say, the excellent filer of tomorrow is going to be the expert on extra thin saws.

Thin blades are relatively harder than thick to make go right. This is a great reason: As much clearance on either side of the plate is required for the one as for the other; the thin saw must cut more wood for its thickness, and therefore for its strength, than the thick saw. Figure it out as minutely as you please for yourself; I think you'll find it interesting. But the thin blade has one thing in its favor, although this cannot make up for the foregoing feature not in its favor: owing to its readily conforming to the circumference of the wheel, it is not so apt to crack as its bigger brother.

Now in caring for the delicate fellows, one must be sure that everything is as it should be. The swage anvil must be perfectly square, and it must set on the back of the points correctly, or the points will be bent out to one side. Owing to the width of spread required in comparison with the thickness—or the thinness?—of the plate, the swaging should be barely sufficient or the point may split; and if it doesn't split, the over-working of the steel with the shaper in the work of getting the spread down to the necessary littleness will cause the point to crumble away. If the steel is hard enough to hold a cutting edge, and to hold tension satisfactory, it will crumble when it is over-worked. This latter is a common complaint with some young filers I know; and in this connection I will mention that I have seen more than one good saw returned to its makers unfairly.

A not unusual variation in the practice of fitting thin blades comes with the automatic sharpener. If it does not face up and back up the teeth squarely, the good effect of the squareness of one's swage will be lost. If the emery wheel blues or case-hardens the points, they will crumble away and give trouble; and for this evil a nicely-running machine and an emery wheel of the right kind, kept faithfully dressed with a dresser, is the remedy. If the teeth are bent, ever so slightly, the grinder, though set squarely, will not do its work right. Bent teeth should be leveled going through the grinder and not afterward.

In hammering, the same patient care that is observed elsewhere should be observed even more. The hammer that fills the bill on the big saws will not always fill the bill on the delicate ones. A light hammer is best, one with a long, flat-oval face. Especial care should be given to the roots of the teeth, and one should not be misled into hammering too much or too little by the light that shows in the gullets. The leveling-block should be surfaced as frequently as it shows rounding on the edge over which the teeth are worked.

In rolling the thin saw, the roll line that will barely affect the thicker blade will often cause the little fellow to fly open almost from one edge to the other. One should move carefully here, indeed. The rolling should be very lightly done, and well distributed over the tight surfaces. Of course the rolls should not dish the plate; however, even with the most perfectly ground rolls, dishing will occur if the saw is held too high by the operator, or if it passes out at too sharp a downward or upward angle. It is an act of wisdom to apply the straight-edge upon the freshly-rolled surface, just to make sure.

Here is a little handicap in the thinner blade that is worth the mentioning: The relative amount of tension being the same, the thin saw will not flatten out on the leveling-block so readily as the thicker saw. The very best thin-saw filers I have known carried as much tension as they could level perfectly, using a weight on either end of the section being treated by the hammer. To go beyond that amount of tension, of course, would be to defeat one's purpose for the surplus metal of the central parts would bulge out into lumps, even if the plate could be leveled at the outset.

As to crown, one should be governed by the machine on which his saws are to be run. This I regard of great importance, and I gleaned the idea from experience. The degree of crown that suits a short saw running on wheels close together, is not the best degree of crown for a long saw on a machine with wheels far apart. A little experimenting is necessary, of course. Taking for granted the wheels are in line, with true faces, pull the crown out until the saw begins to flutter on the back; this is not an absolutely safe rule, but it will do as a rule to begin one's little experimenting on. On machines in good order, the correct amount of crown will run from 1-64-inch in 6-feet to 1-32-inch in 5-feet.

I did not leave the machine itself until the last because I regarded it of the least importance. If the best machine on earth is wrong in its adjustments, the best saw on earth won't run well on it. Too often a band resawing machine is given a lining-up of its two principle shafts, and then expected to work miracles. Even if the two principle shafts and their respective wheels are in perfect level and line and well-fitted in their bearings, if the guide as it moves up and down is not in line with the saw there's trouble. I have seen a few filers pull themselves out of a hole, and a bad hole, by putting the rolls and the guide where they belonged. To sum up, everything must be in favor of the extra thin saw if it is to hold its fitter his job.

To Rearrange the Sash-Cutting Department

Contributed by H. J. Brown

It is rather surprising, especially in these days of insistent demands for efficiency in all work done, to find how uneconomically the plant is arranged in some of our planing mills. Naturally most of these inefficiencies are found in the older concerns, but at the same time one is led to wonder why it has not been thought worth while to correct glaring instances of poor planning. The illustration in Fig. 2 is taken from a plant in actual operation. Rather than make some rearrangements such as suggested here, they go on paying wages for labor that is really wasted as far as results are concerned.

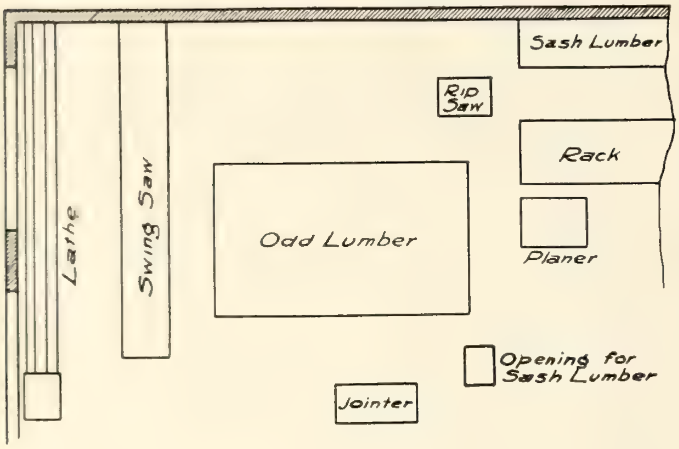


Fig. 1

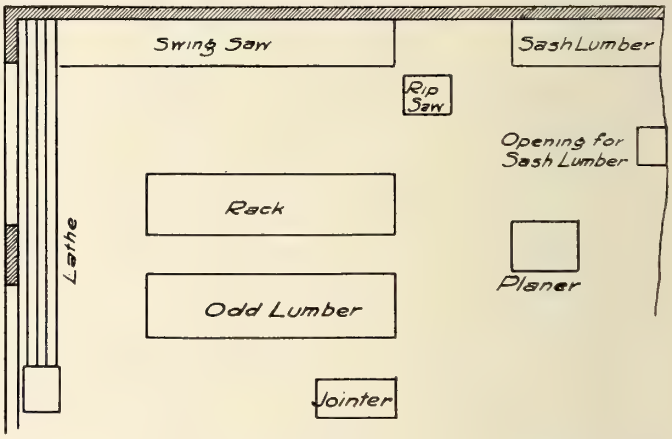


Fig. 2

Fig. 1 is a sketch plan of the lay-out of that corner of the plant devoted to cutting up stock for sash and doors. Practically all the lumber for this work' is dressed in a double surfacer downstairs, and is pushed up through a hole in the floor as indicated. Then follows an exhibition of weight-lifting and balancing on the part of the man who has to pull up the lumber and have it pushed across the pile of odd lumber that occupies all the space in front of the planer. Another man is required to stand by the rack to receive the planks and pile them ready for the rip-saw. During this time neither planer nor jointer can be operated with safety. The pile of odd lumber indicated in front of the planer consists mostly of material brought in, but not used on the job for which it was intended, owing either to defects or because more lumber was brought in than was necessary. All this material goes into the pile, there to remain until the heap gets so high that it is impossible to feed long material into the planer. Then again a day or two is spent in sorting out and distributing all the odds and ends. Of course in a jobbing mill a certain proportion of miscellaneous strips are bound to accumulate, but this should be easily taken care of in the space shown in Fig. 2 set apart for that purpose. All material that can be included in any of the regular stock piles should be returned to them at once when such lumber is not utilized on the order intended.

As to the actual cutting, all the sash lumber, after ripping, has to be turned around a roof support located near the corner of the odd lumber pile, and laid on the swing saw bench. It takes nearly as long to turn a piece around to the swing saw as it does to cross-cut it. The swing saw bench at present is less than twenty feet from the rip-saw, so that when there are any 20-foot boards to be ripped, it becomes necessary to erect a temporary support to guide them over the bench. If the swing saw was moved over to the wall, as in Fig. 2, the stock would leave the rip-saw in the correct position for placing on the swing-saw bench without any turning around. Then the rack used for meeting rail stock could be moved up level with the odd lumber pile as in the same illustration, leaving a free space between for feeding the planer. A new opening could be made back close to the sash lumber pile, so that the lumber could be pulled up and piled by one man without obstructing the use of the planer or jointer. The experiment should be worth trying.

If the glue room and the finishing room would cooperate to eliminate faults, instead of both trying to shift the blame onto the other, there would be better work, and better feeling all around.

The few men who get to the top of the ladder of success need good men at the foot of the ladder to steady it.

People will not object to paying you more money for goods than other stores charge—if the goods are worth the difference.

Don't object that your duties are so insignificant. They are to be reckoned of infinite significance. Whatever thy hand findeth to do, do it with all thy might and all thy worth and constancy.—Carlyle.

Practical Points Regarding the Sash Sticker

Contributed by F. L. Gourlay

IT is possible that a few points regarding this much-abused machine may not be without interest to its operators or part operators. This term is used advisedly in the sense that many sash stickers are not in the care of one operator, but are used for anything from panel raising to sticking 3-16-in. x ¼-in. glass beads. Some men take the trouble to balance their knives, while others come along and practically pound all the babbitt out of the bearings by grinding up just one knife for the job, taking the first odd one that comes to hand to put on the opposite side of the head. After that it matters little whether the knives are balanced or not. The head will jump all ways with the vibration of the machine, and produce an attempt at corrugated mouldings. The chief drawback, however, is that the corrugations are not likely to be equal in spacing. Therefore the millwright is called in to re-babbitt the bearings, and the cycle starts all over again.

For ordinary stock pattern sash work of course the Shimer Head is not to be surpassed especially when used in connection with a coping head of the same make on the tenoner. Much of the most difficult parts of sash machining is rendered easy by the use of this combination. For some odd varieties of storm sash, however, it will often seem rather a heavy investment to get these heads and yet to set up an ordinary square head for such jobs is likely to consume a lot of time, owing to the necessity of getting an accurate fit to the shoulder of the tenon.

In cases like this there is another sort of head for keeping permanently set up. This is illustrated by Fig. 1 which shows two sectional views of the head and the method of clamping the knives. A back fits right over the knives and a set-screw (A) through the side of the head is used when more than one knife is put on the same side to ensure that the knives will always be close together. For a sash mould it is usual to employ three knives as shown in Fig. 2, to promote facility of grinding the part which cuts the square member. This is not always necessary, as each knife may be made in one piece and one of them ground out to clean the mould and rebate altogether, cutting the square part only, while the opposite knife cutting the mould and rebate has a deep slot cut in to clear the square member (Fig. 3). By this means it is possible to sharpen the small cutting edge without marring the rest of the knife. When the knives used do not take up the full width of the heads short pieces of the same steel may be used to take the pressure of the setscrew (A) at the side. In all cases where more than one knife is used on each side care must be taken that all are of equal thickness.

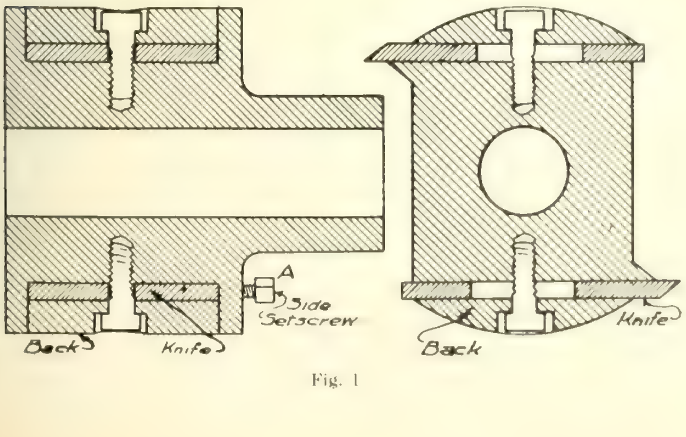


Fig. 1

Panel raising can also be done on the sash sticker, by using knives to cut the desired shape. Owing to the necessity of cutting across the grain when working the ends of the panels, it is best to get a special head with the knives set to make a shear cut, as is done by a tenoning machine. Put on the slow feed and keep the chipbreaker and shoe as close to the cutter as possible. Start on the end of each panel and follow round in rotation so that the last cut is with the grain. Do not try to load up the ordinary square head for wide mouldings. Sash stickers are built for moulding the edges of stock rather than the face, and give no support to the outer end of the spindle, so that trying to cut with knives more than three inches or so from the inside is likely to result in a sprung spindle if nothing worse. Nor should it be taken for granted that because it is only a small machine, the head may be run out of balance once in a while with impunity. It will result, as already stated, in loosened bearings and rough work.

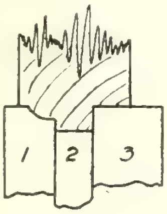


Fig. 2

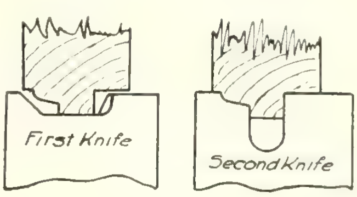


Fig. 3

Be the machine large or small it is surely worth while to extract from it the best possible results. Even the small machines cannot be had for nothing, so for the sake of getting a fair return on the investment take care of them.

Revival of Plain Oak

After remaining in the background for a number of years plain oak seems once again to be finding its way into popular favor. At one period oak was a favorite in the kitchen cabinet trade, but it was forced to give way in popularity to gum. This year, however, it appears to be coming out again with excellent prospects. Not only is it to be seen in kitchen cabinets, but it is also being featured in office furniture. Indeed there is some indication that we are to have a revival of plain oak in all furniture lines. Plain oak is more generally finished in natural color, is free from the injurious stains that seriously hampered the trade for this wood in former years, and there is a higher order of finished workmanship which goes with it all around. Present indications point to a new era in plain oak, and it is probable that good rotary cut plain oak veneer is about to get the treatment of which it has long been deserving and that it will be finished in future as it should be.

Devote your time to curing your men of the big faults rather than to nagging them about the minor ones.

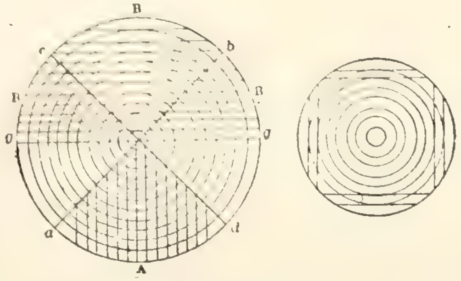


Fig. 1 Quarter-log method of quarter sawing.

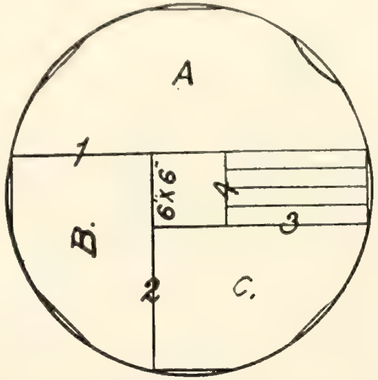


Fig. 2—Opening the log, the heart boxed.

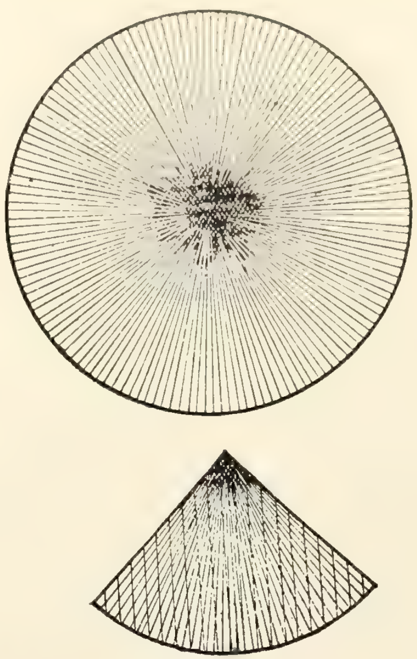


Fig. 7—Effect of close rays, quarter-log method.

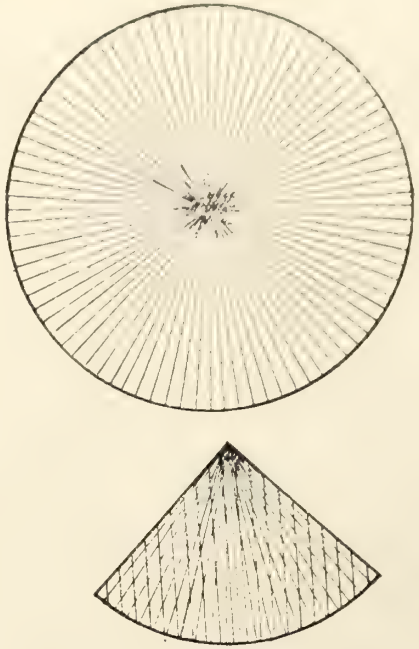


Fig. 8 -Effect of scantier rays, reducing figure.

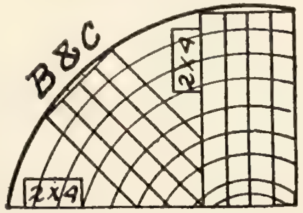


Fig. 3—Sawing B and C, Fig. 2.

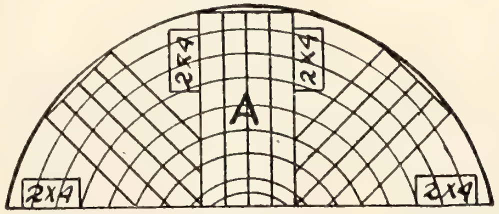


Fig. 4—Sawing section A from Fig. 2.

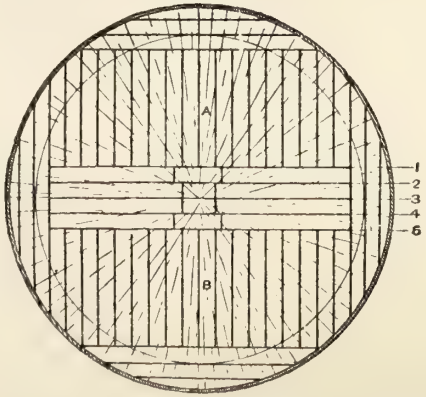


Fig. 5—Sawing yellow pine edge grain flooring.

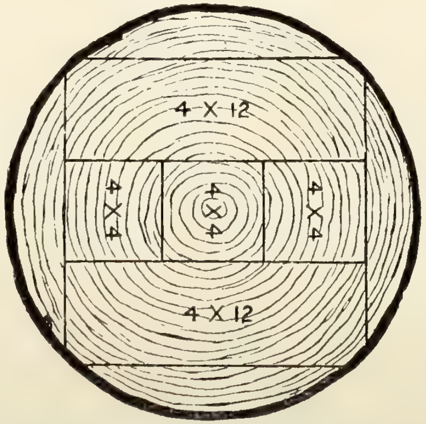


Fig. 6—Another Edge grain flooring method. Boxing heart.

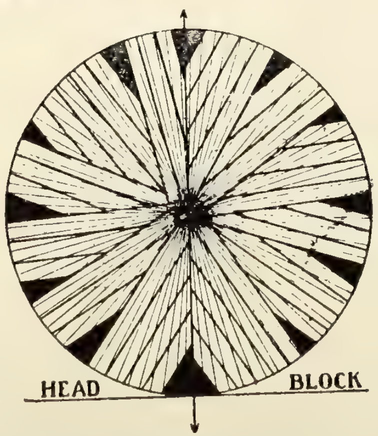


Fig. 9—Quarter-sawing by successive tilts of half-log.

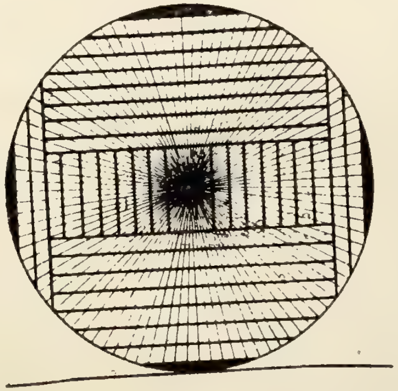


Fig. 10—Plain-sawing diagram.

The Various Methods of Quarter Sawing

Various Methods of Quarter Sawing

Description and Diagrams for Getting the Best Value When Cutting Up for Figure

THE accompanying illustrations, which represent the customary methods of quarter sawing, will be valuable information to file away for future use. They also will give woodworkers in general an excellent idea of the manner in which quartered oak is produced.

In Fig. 1 the small diagram illustrates the ordinary method of squaring a log and the saw cuts on the upper half of the larger figure show the relation of the circular annual rings to the boards produced by this method. The board "G" is truly quarter-sawed. Those next to it, up to "B," are practically quarter-sawed at the outer edges, but have a section which is truly flat-sawed in the center of the board, and this proportion of flat to quartered or partly quartered stock increases in the boards toward the outward edge "b." The lines "ab" and "ed" show how the log is usually split into quarters for quarter-sawing, each quarter then being turned on its back and sawed, as in "a." This produces truly quarter-sawed stock at the center of the wedge and makes a sufficiently close approximation for most purposes, except at the extreme corners.

A method of quarter sawing which produces a larger proportion of more exactly quarter-sawed stock is represented by figures 2, 3 and 4. Fig. 2 shows how the heart is boxed and "B" and "C" from this diagram are then manipulated as in Fig. 3, while the portion "A" of the log is handled as in Fig. 4.

Figures 5 and 6 relate to the sawing of edge-grain flooring from yellow or Norway pine. In Fig. 5 the log is first approximately squared, and cuts 1 to 5 are then taken through the centre. The cants "a" and "b" are then piled one on top of the other and sawed together, as indicated. Approximately all of the lumber within the inner circle is sufficiently quarter-sawed to answer the purposes of edge-grain flooring. Fig. 6 shows a different way of handling the log after being squared, the heart being boxed and used for dimension, while the two pieces 4 by 12 and the two pieces 4 by 4 are sawn into flooring strips.

Figures 7 and 8 show the same method of quarter-sawing as is indicated in Fig. 1, the quartered log being turned on its back and sawed through without changing position. These figures are intended to illustrate the effect upon the figure of the resulting boards if the log, as in Fig. 8, has only half as many medullary rays. It might be remarked, parenthetically, that an oak tree of a given botanical description does not vary much in this regard, whatever may have been its growth environment. The proportion in volume of the medullary rays is pretty constant to the other or vertical cells, although it is possible that a large portion may be of the small and inconspicuous variety and a smaller proportion of the broad thick rays which are most prominent in quartered figure. Where a number of different kinds botanically are commercially lumped together as "white oak" or "red oak," there may be considerable variation in the number of medullary rays.

Figures 7 and 8 emphasize the need for careful selection of wood for quarter-sawing purposes. A reader commenting upon these figures states that if the poorer log shown by Fig. 8 had been sawn into wedges of one-eighth instead of one-quarter and each of these wedges had been sawn into lumber, the average resulting figure of the boards would have been superior to those shown from the better log in Fig. 7 by the quartering method. This, of course, is because in the narrower wedge all the boards approximate more closely to true quarter-sawing. Yet it should be remembered that at some point in the process the increase in labor and waste overbalances the gain in quality.

Figures 9 and 10 illustrate the sawing methods used by a New York State firm, Fig. 1, of course, representing plain-sawing. A little study of figure 9 will show that the log, in effect, is divided into 12 wedge-shaped sections, each of which is sawn up parallel to one of its wedge faces. As regards the product this is equivalent to sawing the log into six wedges and sawing each wedge parallel with its center line. Inasmuch as the method described above by a reader divides the log into eight wedges instead of six, sawing each parallel with the center, it approximates true quartering more closely than does diagram 9.

In the above remarks it is not assumed that the log is actually divided into 12 wedges as an initial operation, because undoubtedly each half of the log is progressively canted or tilted upon the block in the method of sawing figured by this diagram.

Red Gum as a Furniture Wood

As a furniture wood American red gum is occupying a prominent place amongst high-grade woods in the furniture trade. The Gum Lumber Manufacturer's Association, of Memphis, U.S.A., are conducting a campaign in favor of this wood in which particular attention is called to the beauty of red gum finished in its natural color. Reference is made to an exhibit in Memphis at the present time of a beautiful suite of bedroom furniture manufactured by the Carrollton Furniture Company, of Carrollton, Ky. The exhibit has been inspected by many discriminating furniture dealers, some of whom have pronounced this red gum furniture as being more desirable than mahogany and just as beautiful as anything they have seen in Circassian walnut. Red gum is the material commonly used in the manufacture of the solid parts of Circassian furniture. It is also true that red gum is about the best wood available for making imitation mahogany or Circassian walnut. It is also used extensively in other products of the woodworking field. Besides becoming one of the most popular cabinet woods because of its own beauty, it is fast becoming one of the most popular woods to be used for interior trim of buildings of the best class. It may be stated for example that in Prudence Risley Hall, situated on Cornell Heights on the property of Cornell University, the entire interior trim is of gum. Other buildings in various parts the States are also trimmed throughout with red gum, which is testimony to the beauty and utility of red gum and an indication that its consumption in the future will be largely increased.

Two Practical Suggestions for the Home Woodworker

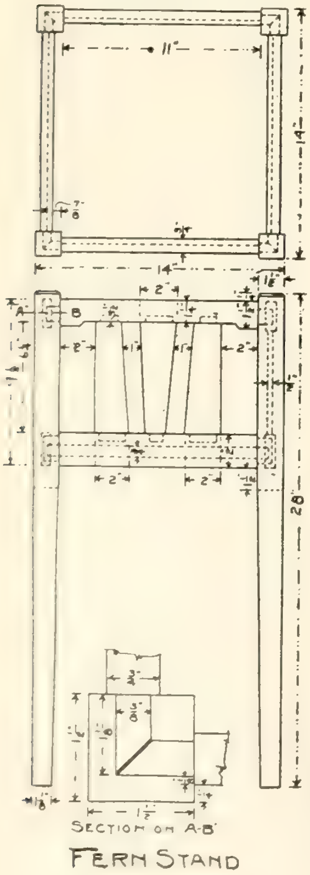
By One of the Trade

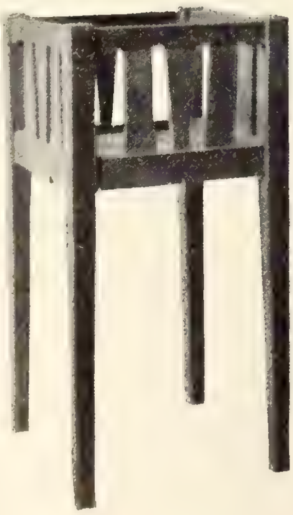
It is a matter of common observation in the woodworking factory that there is a certain type of workman whose mind is always particularly active along the line of improvement for the home. He is always talking to Brown or Jones, who is generally of a like turn of mind, about making something, whether it be a chicken-house or a kitchen cabinet. Always the object is to get something into his home of his own manufacture, and preferably of his own design as well. As a rule he is only too pleased to pick up ideas from outside sources for his own adaptation and herein lies the secret of many a noon-hour conference with a fellow-employee. The writer is thoroughly in sympathy with a man of this temperament and his object in the present article is to provide him with something that will afford him a background to work upon.

As a first instance take the fern stand illustrated in Fig. 1. Black walnut with a natural finish looks as well as anything for a piece of furniture of this kind, and next to that ranks fumed oak. A dark finish is best. No doubt the finish of the furniture already bought will be responsible for the final choice of the individual. The stock bill for the fern stand is as follows:—

Posts, 4 pieces, 1½ by 1½ by 28½ inches, S-4-S.
Rails, 4 pieces, ¾ by 2 by 13 inches, S-4-S.
Rails, 4 pieces, ¾ by 1½ by 13 inches, S-4-S.
Slats, 12 pieces, ⅜ by 2¼ by 7 inches, S-2-S.
Bottom, 1 piece, ¾ by 12½ by 12½ inches, S-2-S.

Taper the four posts to 1⅛ in. at the bottom and be careful that the taper is on the inside faces of the posts, the same as the mortises. After planing square, the two outside faces do not have to be touched at all. To relieve some of the severity of the straight lines the lower edges of the top rails are recessed ½ in., and the top ends of the posts are lightly chamfered. The ends of the rail tenons are mitred as shown to just clear one another when the shoulders of the rail are tight. The slats may be tapered as shown, or left parallel. It adds a little variation, however, if they are tapered, the middle ones on both sides and the outer ones on the inside edges only. After sanding, two opposite sides are glued up separately and when set the remaining parts may be placed and the whole clamped.





Details of fern stand and the pieces assembled in the completed article.

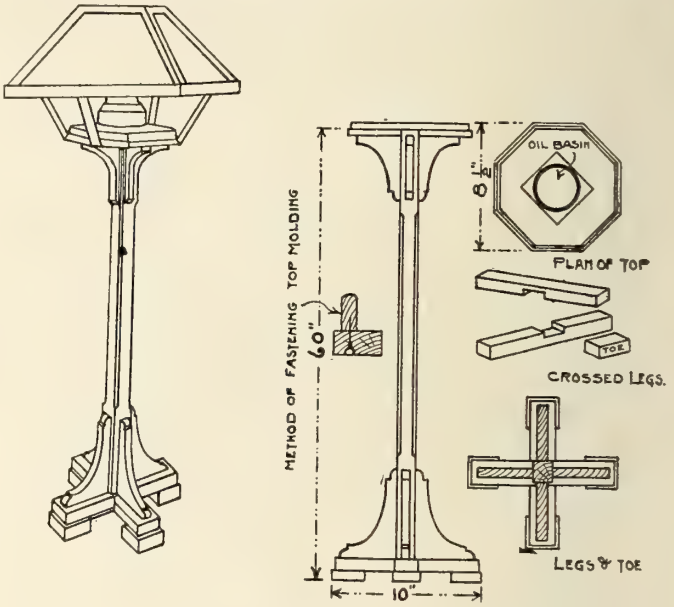


Fig 2—Details of lamp stand with view of completed article.

To get the natural finish on walnut, if such be desired, apply a coating of paraffin oil, or boiled linseed oil if the first is not available. Apply with a cloth and after allowing it to stand about twenty minutes or so, wipe off the surplus liquid. Then leave for at least forty-eight hours before applying a very thin coat of shellac, which must be left over night, when the whole may be sand-papered smooth with some No. 00 paper. Finish by applying on this shellac base several coats of good furniture or floor wax.

A fumed oak finish is obtained by enclosing the stand in an air-tight box with dishes of liquid ammonia. This ammonia must be strong (26 degrees Baume) to obtain good results, and the stand should be left in the box until the required depth of color is obtained. Then it is given a good airing to allow the fumes to evaporate thoroughly from the wood previous to finishing with wax or paste filler and matt varnish.

Another piece of woodwork that will afford plenty of opportunities for modification to conform to the ways, means, and personal desires of the maker, is shown in Fig. 2. which illustrates a dome lamp stand.

The dome frame is made entirely of ½ in. x 1 in. with a ¼ in. x ¼ in. rabbet for glass. The lengths needed for a dome 14 in. square at the base and 8 in. high as shown, are as follows:—

Bottom strips, 4 pieces, ½ by 1 by 14½ inches.
Top strips, 4 pieces, ½ by 1 by 6 inches.
Stide strips, 8 pieces, ½ by 1 by 9 inches.
Dome supports, 4 pieces, ½ by 1 by 6¼ inches.

The stock bill for the stand is also given:—

Post, 1 piece, 2 by 2 by 58 inches.
Top, 1 piece, ⅝ by 8½ by 8½ inches.
Cross feet, 2 pieces, 1 by 2¼ by 9½ inches.
Toe blocks, 4 pieces, 1 by 2¾ by 2¾ inches.
Lower brackets, 4 pieces, 1 by 3¾ by 6 inches.
Upper brackets, 4 pieces, ⅞ by 3 by 4 inches.
Top mold, 8 pieces, ½ by ¾ by 3¼ inches.

Each side of the dome frame is put together separately and then each is mitred together after, for easier fitting. The dome is filled with art glass.

The top of the stand may be made square if desired, although it is illustrated as octagonal, and must be recessed to fit whatever form of oil reservoir is to be used. The past is chamfered to within 1 in. of the ends of the brackets, and the lower end is secured to the cross feet by a dowel passing right through the joint of the feet which are dadoed as shown. The toe blocks are made to project ¼ in. beyond the ends and sides of the feet. As the lower brackets are secured by screws countersunk into the under side of the feet, the toe blocks must be left till last. The brackets are dowelled and glued to the post, and the top is bored on the underside for short dowels to fix it to the upper brackets. Choice of material and finish in this case has been left solely to the maker, but it may be suggested that something of the nature of gum, whitewood, or chestnut is very suitable for this stand.

These two examples are comparatively simple in themselves, but they are the sort of thing that is apt to start a train of ideas in the head of the ambitious woodworker, and, as such, their appearance in these columns is justified.

The Manufacture of Excelsior

According to a recent report approximately one-quarter of a million tons of excelsior are made every year in the United States. Expressed in board feet the material consumed is equivalent to about 60,000,000 ft. in lumber. The principal requirements of the wood for excelsior manufacture are softness, straightness of grain, freedom from knots, good fibre and the ability to work well under the knife. The broad-leaf species represented by poplar, basswood, whitewood, tulip or willow, are best. In the south and middle west large quantities of pine are used for this purpose, but the product is not of the highest grade. In Europe the principal excelsior woods are fir and spruce, but their product does not rank as high in resilience and toughness as that of the broad-leaf trees mentioned. Of the several grades of excelsior the finest and softest is known as wood wool. The strands or filaments composing this grade are very narrow and this can be made from only the best material. In medium and coarser grades the filaments are thicker and range in width from a sixteenth to a thirty-secondth part of an inch. For special purposes the filaments are sometimes made as wide as one-third of an inch. Excelsior wood should be reasonably straight and free from large knots. It is usually sawed into lengths of 4½ ft. and peeled. Machines for making excelsior vary in design from an upright form taking one or two blocks at a time to an eight-knife, horizontal machine taking as many blocks. The latter type is used largely in the south and the output of these machines depends upon the kind and condition of the wood. The capacity of the upright type under the best conditions is about 800 lbs. of medium-grade excelsior in 10 hours for each knife.

Care of Hardwood Flooring

By Frederick J. Schroeder

THERE is no finer kind of interior finish manufactured than good hardwood flooring, but only too often it is treated as though it were ordinary rough lumber. Many who would not think of giving hardwood doors, stair work, etc., anything but the very best care and attention often make the big mistake of allowing their men to handle hard wood flooring roughly, and are seemingly not at all particular as to whether or not the flooring is exposed to dampness. As a consequence, by the time the flooring is ready to be laid, it is sometimes the case that the edges have been battered or slivered and very often the flooring has absorbed so much moisture that it is badly swollen and that of course makes it very hard to drive up and sooner or later, when the building is heated, the flooring is bound to warp and shrink.

As stated before, good hardwood flooring is interior woodwork of the very highest class—and it should be treated accordingly. In the first place, the flooring should not be delivered to the job until the building is ready for it. It should never be piled outdoors for any length of time, but should be put under cover immediately—housed in the dryest room it is possible to find. Good flooring should never be laid over fireproofing material until same is thoroughly dried out, nor should it be laid over an old floor until its surface has been made perfectly level.

In our factory hardwood flooring is never exposed to moisture. After the thoroughly air-seasoned stock has been steamed under pressure to open the pores of the wood the flooring lumber goes to the dry kilns, where the hot dry air drives out every particle of moisture—seasons it thoroughly, through and through. From here it goes directly to the flooring machines from whence it is conveyed directly to our dry-air storage warehouse, located directly over the dry kilns, where there is never a drop of moisture from one year's end to another.

We have a rule at our plant that flooring must never be delivered to a job on rainy days, and this rule is rigidly enforced. We have had more than one "squabble" with architects and builders.

In shipping carload lots of flooring, we always see to it that the cars we get are absolutely dry, because if the flooring were shipped in a damp car it would be quite likely to absorb enough moisture to cause trouble later on.

Remember, good hardwood flooring is like a sponge. It will absorb moisture if exposed to dampness for any length of time. A little extra attention in caring for the flooring before it is laid means years of satisfactory service. Carelessness in handling this important item of interior finish means extra work for the contractor in laying the floor and permanent dissatisfaction for the home-owner. The ugly, dirt-catching cracks to be found in the floors of many fine homes are often due to the fact that the flooring manufacturer did not thoroughly season the lumber for his flooring—but just as often the carelessness of the contractor is responsible.

Systematic Cost-Finding in the Box Business*

By Henry Stephens

I REALIZE that it is a presumption on my part to undertake to enlighten you on this subject; especially as I am young in the business, having been engaged in this line directly and indirectly since 1868, only a short period of forty-five years. I have come to the conclusion that it will take double that time (or ninety years) before any half-dozen men will figure alike on the cost and contents of boxes, unless you can adopt some simple method like the one I am about to lay before you.

The present method of figuring is to charge a certain rate per foot, the price having been based on the cost of manufacturing a certain number of millions cut during the year. To my mind some customers have been charged too much and others not enough; consequently, it seems to me that a cost of each individual size should be kept, or at least on every half foot, commencing on a 5-foot box (net), which is considered to be the most profitable size box to make (per 1,000 feet of lumber), then graduating down from 4½ down to a 1-foot box. You will find that the cost, say, is $1 additional for every ½-foot for manufacturing down from a 5-foot box to a 1-foot box or $19 per 1,000 feet for manufacturing 1,000 feet lumber into 1-foot boxes, basing your 5-foot box, say, at $11. When over 5 feet and under 10 feet the base would be about the same as a 5-foot box. Over 10 feet will cost a trifle more per 1,000 feet lumber. You will notice from my cost card that I have deducted the cost of nails and nailing on the 20 per cent. waste of lumber in manufacturing made-up boxes. Now if you will have your superintendent keep the factory cost of making nine lots of 300 or 500 boxes of each size, beginning on a 5-foot (net) box and then 4½-foot, 3, 2½, 2, 1½ down to 1-foot, which can be done from time to time as the opportunity presents itself, you will arrive at nearly the actual cost.

Now, after you have ascertained the cost of manufacturing and, say, you find that the factory cost of manufacturing 5-foot (net) boxes,

amounts to	$ 9.50 per 1,000 ft.
All overhead expenses	1.50 per 1,000 ft.
	$11.00 per 1,000 ft.
The next 3 or 500 lot 4½-foot boxes	12.00 per 1,000 ft.
and so on down every ½-ft. to 1-ft.	19.00 per 1,000 ft.

adding $1 to every ½-foot as you go down, or, whatever you may ascertain it to be; then you add the price of your lumber to the cost of manufacturing, then 20 per cent. for waste lost in manufacturing and on your lumber, the total will be your actual cost, to-wit:

Cost of manufacturing 5-ft. (net) boxes	$9.50 per 1,000
Overhead charges and all expenses	1.50 per 1,000
Price of lumber delivered in factory	17.00 per 1,000
	$28.00 per 1,000
20 per cent. waste on $28	7.00 per 1,000
	$35.00 per 1,000 5-foot net
	$17.50

5-foot box cost 17½c.

Some figure 20 per cent. waste only on the lumber, or whatever per cent. their lumber cuts, whether it be 5, 10 or 20 per cent. waste; at any rate the per cent. waste in your lumber must be added to the cost of manufacturing as well as to the lumber. You all know that when you cut up lumber, say 100,000 feet, you only get 80,000 feet cut into boxes (on a 20 per cent. waste).

Regarding overhead expenses would say that the expense is for salaries, salesmen, all office help, taxes, insurance, interest on your investment, rent, depreciation, lost accounts and many other expenses too numerous to mention (including your own services).

The amount of overhead charges is ascertained by the total amount of lumber you cut in a year, whether it be 75c per 1,000 or $1.50—which of course is added to the factory cost. This same system applies to the shook manufacturers, as you will observe by my cost card. Now by keeping tab on 17 lots of boxes instead of nine lots you can arrive at the cost of manufacturing on every ¼-foot beginning on a 5-foot box down to a 1-foot box.

Every box manufacturer knows how to figure feetage, but in doing so makes errors in his calculations, either by omitting one or both ends or cleats and frequently forgets to add ¼ to the ½-inch body of a box, or ½ for a ⅝ body. Errors are also made in putting down the decimal figures as taken from the various estimator books. In order to detect errors, two men should figure, one to check the other. But, the best detector is the Stephens ready reckoner for all ⅜-½-⅝ body (⅞ ends) and ⅞ boxes, which covers 80 per cent. of all the boxes made.

To the few box manufacturers who are not familiar with this book I would say that it shows the amount of lumber required to make any size box, whether ⅜, ½, ⅝ or ⅞ (lumber measure), on even inches and by consolidating fractions into even inches, you readily find at a glance the desired result. This book has 56,000 calculations and is guaranteed to be correct within ⅛ foot. If two or more box manufacturers in a city would adopt this book (which has been done) they would come nearer to a uniformity in feetage than they do now. Ten per cent. for waste has been added in these calculations, which was the average waste when this book was compiled; the box manufacturers had a better grade of lumber at that time. Notwithstanding that this book shows a larger feetage than actual contents, I claim that it should be so for the benefit of the manufacturer, to cover dead horses, mistakes in cutting and many unavoidable and unseen expenses.

Often low prices are caused by low feetage (errors); the great desire to meet competition influences the salesman to cut down the feetage in order to secure business. I know of a case where the salesman represented to his employer that he had made a very favorable sale or contract showing the feetage and the high price secured per 1,000 feet lumber; at the expiration of said contract (one year) the buyer requested a lower figure for a renewal of the contract; refiguring became necessary to ascertain whether a deduction could be made; whereupon it was discovered that the box figured 5 feet instead of 4 feet, having lost a leg (I mean foot) during the year.

It is needless to say that the salesman "vamoosed" before the final discovery. Now, what I am driving at is this—if the manufacturer had had one of Stephens' books he would have discovered at a glance the error which cost him several thousand dollars.

---

*Extracted from an address delivered at a recent meeting of the National Box Manufacturers.

I have been unable to discover or understand why box manufacturers figure down to decimal fractions on feetage; I claim that he should have at least ¼-foot leeway, no fraction less than ¼-foot. Lumber is not sold or measured on such small fractions; the lumber measure or rule calls for 12, 14 and 16 feet; if the board is 11⅝ inches wide it is measured as 12 inches and sometimes boards are not full length.

If you want to meet competition, cut your price and do not fool yourself on the amount of lumber required to make boxes.

Dry Rot in Factory Lumber

An interesting article on "Dry Rot in Factory Lumber" by Mr. F. J. Hoxie in the Southern Lumberman discusses in detail a number of causes contributing to the prevalence of dry rot fungus, also the qualities of wood which make it a fungus resistant.

Most of the dry rot cases investigated can be attributed to three causes acting together. First and most important is the use of lumber which has little power of resisting dry rot fungus; second, the lumber has been deeply infected before being put into the structure; and third, the use of water-soaked timber, this in a few cases supplemented by the artificial moisture in common use in textile mills.

The chemical qualities of wood which make it resistant to fungus are not well understood, but the well-known fact that different fungi have decided preferences in the kinds of wood that they attack, shows that both susceptibility and resistance to fungus are specific. The general aim of antiseptic compounds is to be universal and sometimes, indeed, to act from a distance. Undoubtedly, the sterilizing action of the heat used in applying and waterproofing are among the most important valuable qualities of many of those in common use. An antiseptic is not necessarily poisonous. Poisonous qualities are rather a disadvantage than otherwise, if the required results can be obtained without them.

I have examined a considerable amount of rotted material, taken from mills within the last three years. Most of it was hard pine, infected with dry rot fungus, and in all of this the resin appears to be the important factor in arresting the fungus. Density, or fine grain, without resin, are not effective. There are undoubtedly tree-destroying fungi that can attack resinous wood and destroy it, otherwise the forests would be piled high with the trees of past ages. Dry rot can undoubtedly attack resinous wood in time under suitable conditions of moisture, etc. The progress of the fungus in resinous heart wood appears to depend upon the percentage of resin. This is not true of non-resinous heart wood. The resistance to dry rot in hard pine appears to depend upon the percentage of resin, irrespective of botanical variety, longleaf pine deriving its superior durability from its generally high percentage and uniform distribution of resin. It is quite possible that the resin alone is not the fungus-retarding substance. It may be something with which it is associated, or a condition of the wood of which it is an index.

This by no means implies that resin is the only material in wood that will resist dry rot. There is reason to believe that the tannins and probably other materials may have a retarding action on this fungus in other woods. Much more investigation is needed to solve the question of the cause of natural resistance of woods to fungi. Should later experiments show that my opinion that resin may serve as an index of resistance to dry rot in hard pine timbers is correct, I shall be glad to see a more accurate index established.

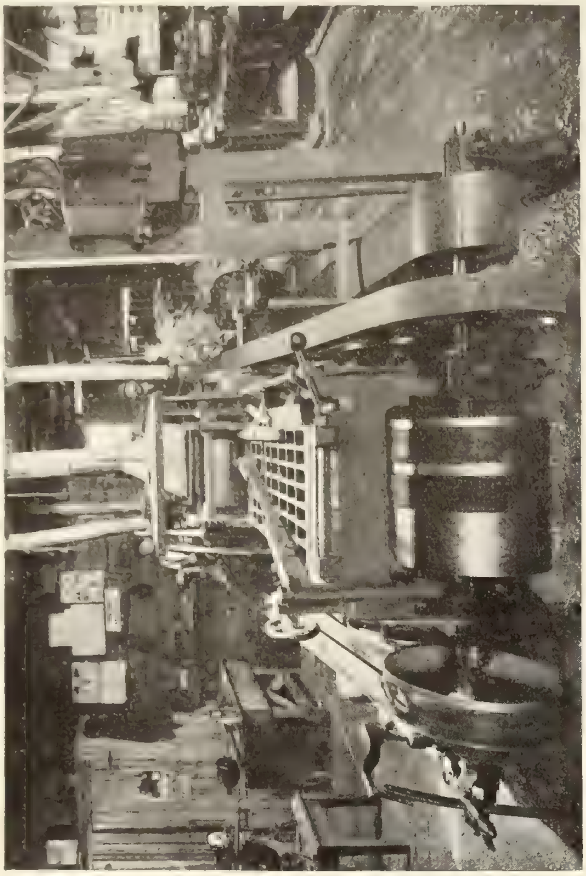
A reliable quantitative standard, well defined and of reasonable simplicity, is highly desirable, as a basis of timber grading. It should not be necessary to use this on every stick, but as occasion requires, to settle disputes or to check the accuracy of the brands suggested by Mr. Weiss. Density and percentage of resin can be expressed numerically and are much less difficult to determine than the composition of steel, which is frequently required in specifications for this material. Pacing may be sufficient for measuring distance in many cases, but a standard of length is carefully maintained for final appeal. In the grading of hard pine timber, where safety to life and property are involved, something more quantitative than grain bands, the statement that good pine is longleaf, and other pine is shortleaf, or, indeed, the percentage of heart wood, is highly desirable if it can be found.

Reliable antiseptic treatment of lumber of a variety susceptible to fungus will not only make it possible to guarantee the desirability of the material, but will prevent fungus infection by contact with infected wood in the saw mill, on shipboard, or in the lumber yard. This is an important matter in the case of dry rot fungus, at least, as it is apparently being distributed widely in lumber from infected yards. Unmistakable signs of this have been found in several cases investigated. When it is in active growth, it is highly contagious. Boards used for sticking lumber piles are fruitful sources of contagion. A fruiting plant, three feet in diameter, was recently found under a lumber pile in a lumber yard.

Careful consideration must be given to the antiseptic treatment, not only from the standpoint of its efficiency as a fungicide, but also with reference to harmful effects on the lumber or building, such as reducing the strength of the timber, or increasing the fire hazard. We are just now adjusting a loss of about $60,000, where a coal tar antiseptic compound which had been used on the roof plank is reported as rapidly distributing the fire.

You will generally find that the man who uses temperature recording instruments in his dry kiln, and looks after them closely, knows more about lumber-drying than the fellow who does not, and he gets better results out of his work.

It isn't a bad plan to take and use an idea from the other fellow occasionally. He needn't be in your line of business either. You may be able to improve upon many ideas that some "other fellow" is using. The main thing is to get the idea.



Webb Lumber Company, Toronto—Feeding-in end of 15 in. matcher.

Webb Lumber Company, Toronto—View of part of the yards.

Webb Lumber Company, Toronto—Individual motor drive on 15 in. matcher.

Webb Lumber Company, Toronto—View of two 12 in. stickers.

An Enterprising Toronto Planing Plant

Progress of The Webb Lumber Company

An interesting instance of business progress based upon experience and energy is afforded by the Webb Lumber Company of Toronto which took over the planing mill business of the Gold Medal Furniture Company a year or so ago. Mr. R. H. Webb had been one of the most valued employees of the Gold Medal Furniture Company, having been in charge of the planing mill end of their work. In this work he had the advantage of being associated with a company which had been in business for over 25 years and had become one of the leading companies in the furniture manufacturing industry. Mr. Webb started work with this company, remaining with them long enough to obtain an excellent grounding in the various departments of planing mill work. Wishing for a wider experience he left the company after a few years and went to the west, where he obtained employment in Idaho, and added greatly to his experience.

Returning to Toronto he took charge of the planing mill end of the Gold Medal Furniture Company's business and continued in charge until they gave up this part of their business. Mr. Webb then took it over, and has developed the business with much success, his energetic methods being largely responsible for his success.

Mr. Webb is quick to realise the presence of an opportunity and to understand the best methods for taking advantage of it. The opportunity for purchasing the planing mill business of the Gold Medal Furniture Company, was apparently the one for which he had been preparing himself throughout his earlier years of business. To-day after a little over a year's experience as the head of this business, he finds himself in charge of an industry which is growing almost too rapidly to be handled successfully. Mr. Webb, however, is one of those men who enjoys such a situation and is certain to come out of it with flying colours.

The plant of the Webb Lumber Company is notable particularly on account of the fact that every machine is run by an individual Westinghouse Electric Motor. The equipment includes two Cowan 12-in. stickers, one Ballantyne 12-in. sticker, one CcGregor and Gourlay 15-in. matcher, 1 Ballantyne cut-off saw and 1 each Ballantyne and Cowan rip saws. The product of the plant consists entirely of interior finish. The company do not handle hemlock or rough lumber of any kind, but specialize in all kinds of hard woods. An interesting example of their work is afforded by the private office of Mr. R. H. Webb, which is finished in a variety of woods, including birch, ash, gum, fir and oak. Almost every known wood which is used for interior work, from mahogany to Norway pine can be found in the company's stocks. The output of the plant during its first year amounted to about 4,000,000 feet, chiefly hard woods. Their raw materials are secured from several mills, of which they purchase the whole output. Some of their stocks are also obtained from wholesale lumber dealers. The company carry on business in Toronto and throughout the province of Ontario in general. They handle all kinds of doors and sash, manufactured chiefly of hardwood pine and fir. One of the chief aims of the company is to specialize in native Canadian woods. In connection with their business the company operate a dry kiln, manufactured by the Standard Dry Kiln Company of Detroit which has a capacity of 250,000 feet.

During his time in the West, Mr. Webb was connected with the Blackwell Company in the Inland Empire. Two of the mills of this company each cut 500,000 and one 750,000 feet of lumber per day. Mr. Webb worked, at various times, in every department, in the woods, saw mills, office and on the road. Every machine in two of this company's plants was run by individual motors and it was there that Mr. Webb was impressed with the benefit of this system, which he subsequently installed in his own plant.

Hammer Swaging

EXPERIENCE has shown that in fitting circular saws for smooth cutting it is best to get any semblance of irregularity from the cutting points of the teeth, says The Furniture Manufacturer and Artisan. It is found that oftentimes a saw that is specially designed for smooth cutting (a saw that is ground in the blade for clearance, so that the teeth do not require setting), will, after being jointed and sharpened carefully by an experienced filer, make a rough cut. The cause can usually be found in the "fash" on the sides of the teeth, made by the file. By removing this the saw will make a perfectly smooth cut.

In mills where a high speed and fast feed are maintained it is essential that the swaging be of such a character that the cutting edges of the teeth will stand a vast amount of abuse without crumbling. Under such conditions a bar swage or hammer swaged tooth is then resorted to in some mills. A hammer and swaging bar are made specially for this work.

Swaging in this manner is accomplished by first swaging the teeth with a conqueror swage. Then the swaging bar or anvil is held under the face of a tooth with the left hand, while with the right hand the top of the tooth is hammered out in the form of a cold chisel with a swage bar hammer. This will add strength to the teeth and prevent crumbling.

However, a great many filers oppose this method, claiming that the swage should be on the fronts of the teeth and not on the backs. They assert that the long swage on the backs of the teeth cause sawdust to collect under it, preventing the teeth from clearing properly; creating friction, and causing saw to labor in the cut. Those filers who hold to this opinion have adapted the eccentric swage. This is done with a machine which places the set on the fronts of the teeth.

Machines are especially designed for this work, and, with a little practice, can easily be handled and adjusted.

A case of wood staining that has attracted considerable attention was that of staining mahogany to represent walnut. This seemingly purposeless use of one valuable wood to imitate another came about from the fact that walnut finish was wanted for a room at a time when walnut of the exact size and kind was not available. Owing to the similarity in grain and texture in the two woods the imitation might deceive even an expert.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Q.—"Babbitt metal, of which so much is used in woodworking establishments is a most mysterious mixture to most of us, and explanations by the people selling it only serve to further confuse the purchaser. Can you tell us if there is any way in which this metal can be judged, so that one may be reasonably sure of getting a satisfactory metal at the minimum price?"

A.—Babbitt metal, like glue is made in an endless variety of formulas, most of which are sold under a trade name and claimed by their makers to be the best on the market for any purpose whatever. Some are good but more are worthless and it would be well as a general rule to avoid metal which can be traced through your knowledge of its manufacturers, to refuse from type foundries and other smelting works.

For light work, such as saw arbors, small shafting not over 1 15-16-in., and in general where the load or speed is not excessive, a metal containing about 83 per cent lead, 15 per cent antimony and 2 per cent tin will be found the cheapest and best. Such a metal sells for around 25 cts. per pound in small lots and any babbitt at a lower price should be looked upon with suspicion under any circumstances. The only place in the woodworking business to the writer's knowledge where a metal of this kind is not suitable is in band saw and planer journals where a harder metal must be used on account of the squeezing tendency which exists at times. For this purpose, a metal composed of about 88 per cent tin and 12 per cent copper, antimony and bismuth is the best, and this mixture can be bought at 60 to 65 cts. per pound.

In the woodworking trade, two kinds of babbitt are necessary as outlined above, but that is all, and two selected with the general composition named will be found the cheapest in the end.

Q.—"We hear a great deal about "Scientific Management," "Efficiency Engineering," etc., and would be interested to know what others think of its application to woodworking trades."

A.—There is without any question, a great deal of valuable information which any manufacturer will discover for himself in his own factory if he will consider himself for the moment an "Efficiency Engineer," with a stop watch in his hand making time studies. There is nothing new in it but a stimulus for such of us as may think we know it all, as every lumber manufacturer well knows that he has to be an efficiency engineer of the first quality and practice scientific management to a considerable degree to stay in business at all, but there is always something new to be found out and if calling **commonsense** and **hustle** by new names will give the hunt a new interest, then there is certainly something in it. The only thing to steer clear of is the details and red tape which some people think are inseparable from Scientific Management, but which generally seriously interfere with its usefulness.

Q.—"What is the difference between a motor and a dynamo?"

A.—A dynamo is a machine which when driven from a source of power like a water wheel or steam engine, produces or generates electricity, the nature and volume of which depends upon the construction of the machine. A motor is a machine which takes the electricity from the dynamo or from a battery, and turns its energy back into power for driving machinery. Dynamos and motors are very similar in design and construction, one being a reversal of the other, as it were, and this leads to the confusion of their functions.

Q.—"What is the best form of wire belt lace?"

A.—The best way to join belts together for any purpose whatever is to glue them, but there are places where wire lacing is just as good and a lot cheaper, and it is to these places that we presume you refer. The best, and in fact the only really successful wire joint is that form which makes a hinge. There are several makes of hinge fasteners on the market, but none of them compare either in economy or dependability with the joint made on the Jackson Belt Lacer or the Peerless Belt Lacer, which are about the same in construction and operation. The former is made by the Birdsboro Foundry and Machine Company, of Birdsboro, Pa., and the latter by the Peerless Belt Lacing Machine Company, of Philadelphia, Pa.

Q.—"What is the best type of resaw for use in a box factory?"

A.—The best type of machine is better determined after one knows exactly for what purpose it is required, but in general, factories manufacturing any kind of boxes or cases require as a preliminary operation, the splitting of thick lumber such as 2-in. and 3-in. down to the thickness required for running single or double as the case may be. For this purpose a vertical 6-in. saw with quickly adjusted and self-centering rolls is the best, the leading types being Mershon and Berlin.

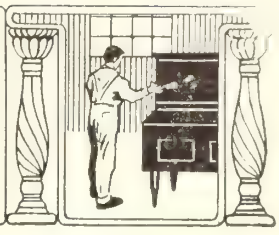
If very small pieces are to be resawed for lock corner or dovetailed boxes, provided they do not exceed about 12-in. square, the Shingle Saw type or Merry-go-round as it is sometimes called does the best and quickest work. These machines can be procured with either power or hand feed, either vertical or horizontal, and the Chase Turbine Manufacturing Company, of Orange, Mass., would be glad to furnish any further information required.

For splitting shook for boxes or cases, there is no machine more satisfactory than a horizontal 7-in. resaw with a hopper feed, and these machines are made with two saws operating at one time if great capacity is required. Such machines are made by Berlin Machine Works, Wm. R. Mershon Company, and Mereen Johnson Company.

As you have neglected to give the class of work for which you desire a saw, you will have to draw your own conclusions from the above as to what is best suited to your requirements.

Mahogany is a wood that has practically always been in demand in this country from its early introduction in the colonial days to the present time, and it has always commanded a good price as compared to native woods. The price has not always been all the importers of mahogany might desire, and, of course, the demand varies more or less in volume from time to time. At the present time the demand for mahogany appears good and the prospects for the year unusually bright.

THE FINISHING ROOM



Processes Employed in the Finishing of Furniture

It is possible, by means of French-polishing, to take a piece of furniture in hand, starting direct from the bare wood, and build up a bright, level, polished surface in a few hours, but unfortunately it will not retain its brilliancy for long, nor will such hurried work wear well.

The reason for this is not due to any lack of skill on the part of the workman, but rather to the nature of the materials he has used.

The French-polish is in most cases shellac dissolved in methylated spirit or wood naphtha in such proportions that the solution must be rather thin to enable it to be evenly distributed by means of a pad of wadding inclosed in a piece of fine soft rag, which means that it must be much more liquid than would be required if the solution was intended to be applied by means of a brush.

Apply the Materials

This thin liquid enables it to be pressed into the pores or open grain of the wood. When these are filled up a superstructure of shellac is built upon them, and, lying on the surface of the wood, gives that bright, level finish peculiar to French-polished goods and free from the garishness of a recently varnished surface.

As this thin polish is thus distributed and forced into the wood, its liquid nature causes the wood fibers to become wet and slightly swell. As the spirit (which holds the shellac in solution) evaporates, the shellac solidifies, gradually shrinking as it becomes drier. This shrinkage causes what had previously seemed to be a perfectly level surface to appear broken up into innumerable small holes, representing the open grain. In practice this is described as "sinking in," and explains why the process of applying liquid polish has to be repeated several times, until what was once the open grain will absorb no more.

Shellac has the peculiarity that it softens up at a rather low heat; at such periods as the duration of a heat wave or a long, hot summer, it is quite a common occurrence to find French-polished furniture which had hitherto presented a highly finished surface become quite dull, and appear as if it had come from the makers before it was finished. The heat causes the film of shellac to soften up and sink further into the wood.

This state of affairs is much more noticeable in America than with us, consequently a French-polish finish (as we know the term) is not popular.

Experience has shown them that successive coats of an elastic varnish, each dulled down and reduced in thickness before the next is applied, till four, six, or even, as in the case of pianos, eight coats have been thus applied, give far and away better wearing results.

This does not imply that the work when finished appears heavily coated with thick varnish; this is only so on the cheaper class of goods, and even these are rarely left with a bright finish. The surface being left dull has a charm about it that appeals to many, and those who prefer it bright soon bring up a gloss by means of a wax preparation. On the higher-priced goods the varnish surface, after being dulled down with pumicestone powder, is brought up to a shine by a process known as "vaporing" or "vapored up," which gives a resultant finish, which, in appearance, is quite equal to a French-polish finish.

The Germans have also adopted the plan of building up a surface by means of successive coats of varnish. The main difference lies in the final method of finishing. There are other points of difference, sufficient in themselves to make a marked change in the appearance of the finished article. By the German process any alteration in the color of the wood is done in such a manner that the original figure of the woods is often entirely obliterated, any figure being sacrificed so long as an even color is gained, whereas the American make a strong point of the original figure showing up. Should there be none they adopt means by which plenty of figure or grain is shown.

Methods of Germany and America

In the German method the varnished surface is French-polished, the latter being finished off with a weak solution of sulphuric acid and chalk, and is commonly called "vitrol finish." In America, instead of French-polishing the varnish it is often dulled down till it gives a half shine—neither bright nor dead—a style of finish familiar to many who may be in possession of an American-made organ. On goods desired with a bright finish, after this grinding down to a dull surface its luster is brought up again with rottenstone and oil, all trace of greasiness being removed by grain alcohol, not common methylated spirit or wood naphtha.

A combination of the two styles (with highly figured woods finished out bright and the plainer looking woods that surround them being left dull) has a peculiar charm about it, whether adopted on furniture goods alone or on the interior fitments which are such a prominent feature of American houses. Necessarily this application of so many coats of varnish and the subsequent operations of grinding each coat to a dead level, take much longer time than French-polishing, and can hardly be called a one-man job, success in this method being best assured when a large number of similar goods are being handled at one time, and the work is sub-divided between different sets of operators.

Unlike the majority of French-polishers who prefer to make up their own solutions, the "wood-finishers," as they are styled in America, have practically everything prepared for them by firms who specialize in their requirements. Thus we find that even in stains, one firm supplies wood stains in such a vast range of colors that even for oak it is possible to obtain them in no less than ten shades, as follows:

Flemish oak, Austrian oak, weathered oak, Flanders oak, Belgian brown, Maltese gray, cloister brown, forest green, deep golden oak, mission room oak, Early English. The last-named is equal to what is known to us as fumed oak.

There are also two rather uncommon styles of finishing oak—one known as verde green, and the other, in which a bold, strongly defined figure stands out prominently under a brown finish. In the former case the result is gained by staining the wood with a not over-strong black dye, and using a bright green wood grain filler, the latter by coating the most strongly marked figure of the wood with French-polish or a thin spirit varnish direct on to the bare wood, using a fine sable pencil. When this is dry the work is coated all over with asphaltum dissolved in coal tar naphtha, and as the stain does not penetrate those parts protected with varnish the result is unique. Some of the penciling is so skillfully done that in some instances the impression is given that the work has been built up from some most uncommon pieces of wood, and shows up to the best advantage when it is finished out bright.

The varnish used, though of a rather quick-drying nature, differs somewhat from our spirit varnish, as is contains practically no shellac, the nearest approach to it being what is sometimes called French oil-varnish.

For dulling purposes specially made brushes are used, these being soaked in oil and dipped occasionally into fine-grade pumicestone powder and brushed well over the varnished surface. This treatment when the surface has thoroughly hardened, soon removes its brightness without scratching it, any excess of oil being afterwards removed with plenty of clean rag.

Practical Hints in French and Oil Polishing

By A. Ashmun Kelly in Veneers

THE finest finish that can be given to wood is plain oil polish, rubbing in raw linseed oil until the wood is quite full and a polish on the surface. That is all there is to it, excepting—well, a lot of long-continued, hard rubbing. Now, plain oil polishing and French polishing are nearly alike; the latter operation requires the use of shellac with the oil.

Omitting the history of this process of French polishing, which is interesting as well as useful, let me say that the process consists of the repeated application of shellac varnish, the rubber being dipped occasionally in linseed oil, the shellac being rubbed into the wood by means of this pad, and not simply brushed on, as no brushing is done. The oil on the pad makes the rubbing easier, and really the whole process is a shellac filling and rubbing, the oil playing merely an incidental part. To do this work you must have a warm and dry atmosphere, a temperature about 70 deg. Fahr. This because shellac is affected by both cold and dampness. Various formulas are used, principally to suit different sorts of woods, but the very best results may be obtained by the use of shellac, though coloring may be added where the wood is suitable and where you wish to add to the coloring of the wood. Thus, for mahogany you can add a half pint each of vinegar and turpentine; soak a woolen cloth with this mixture and rub lengthwise of the wood; follow with a polishing with flannel or other soft cloth. That is one of several methods used. Or red oil may be used, this being a tincture of alkanet root, one-half ounce steeped in one-half pint of raw linseed oil for several days.

The rubber is simply a roll of woollen cloth 1-in. or so wide, wound like a roll of tape. Over this place a piece of muslin, then tie the edges of the muslin together, thus giving a handle to work the rubber with. This rubber is only for flat surfaces. For other surfaces make a rubber from raw cotton, covering with soft old muslin. A rubber must be made perfectly smooth, without a wrinkle. When ready to begin rubbing, first remove the muslin and apply a little shellac to the woolen or cotton, just a few drops, enough to moisten. Replace the cotton cover and dip into oil, then rub. By gently pressing the rubber as you proceed, some of the shellac will escape from it and go onto the wood. Now and then place a drop of oil on the rubber. Use orange shellac for dark woods, white shellac for light woods. Rub with a circular motion. Begin at a certain part and work gradually to the opposite part. When the rubber gets dry, remove cotton and apply a little shellac; return the covering and dip in oil, repeating as necessary from time to time. Rub the surface once a day only, but continue until the surface has a polish.

Oil polishing is simple, yet tedious. Once you get a good oil polish on wood, it is as near everlasting as any finish you can think of. Very little of this work is done, simply because it requires too much time, and this generation of wipers has no time to lose. It interests simply those who would want a piece of work done this way for their own use. The process consists simply of applying raw linseed oil and rubbing it into the wood good and hard, continuing for weeks, on the best work. Think of it! In a manner it may be said that a job of oil finish or polish is never done, for the more it is rubbed the finer it gets, and this means rubbing indefinitely. Whereas, French polishing must be discontinued at a certain stage, or the whole effect would be marred. Wax finish may be said to take the place of oil finish, but is a poor substitute indeed.

Finely figured mahogany is particularly beautified by oil polishing. The oil brings out every beauty of color and form; oak also looks fine done this way; the oil "brings up the figure," to use a workshop term. Oil polishing, such as one sees, is directed principally to dining table tops, because of the liability of hot dishes being placed there and marring the finish. French polish is thus marred, but no so the oil finish; heat does not affect that.

Raw oil is used, though some think a little heating of the oil improves it; for the same reason, and also to make the work easier, certain ingredients are added, but, after all, just the raw oil alone gives the best results. Rubbed once a day, for a week, a fairly good oil polish may be obtained. Never use the oil in excessive quantities.

Coming back to French polishing, here are a few practical pointers. As stated, dampness will spoil the work; if you should notice a milkiness, get the work near heat, only be careful to not blister the work. If the finish has a rough look, or as if scratched, rub very gently with fine or worn sandpaper, but be sure the surface is hard before sanding it. To ascertain if your rubber is right, see if it has a slight pull when working it and that it leaves a slight smear. If no smear or rubber pulls, add a drop of oil to the rubber. But use only enough to cause the slight smear to appear on the work. The idea is to have the rubber leave a very slight film of polish each time it goes over the work. Avoid rubbing too much in one part, but rub equally all over the surface. Too much rubbing in one place may soften up the finish, causing the polish to rub off or rub up into ridges. Don't try to remove ridges by hard rubbing or by rubbing repeatedly in the one place. Do not have the inside rubber, the one containing the shellac, too moist, or it will come through and mar the polish.

After the polishing is done it is "spirited off," or cleaned up with alcohol, using the same rubber that you polished with. Some use the clear alcohol from the start; others reduce the shellac with alcohol each time, until only alcohol remains in the last application of polish. Spiriting off demands care, as alcohol is hard on oil and softens shellac. The rubber, wet with alcohol, is passed rapidly and lightly over the surface, thereby removing the cloudiness caused by the oil, leaving a brighter surface.

Use the alcohol sparingly, and perhaps it would be better to use a new rubber, instead of the old, making a rubber from cheesecloth, of three or four folds; these folds are rather separate sheets, removing one when it becomes dry. Rub with a circular motion when spiriting off, same as in rubbing in the polish. This latter operation is called "bodying in." When doing this latter work, keep the rubber going, once started, and do not stop short anywhere excepting at the end or farther side, and then gradually slide the rubber from the work; this will avoid ridges. An old rubber is better than a new one, hence keep the old one in an air-tight can. To save danger and trouble of the "spiriting off" process some prefer to give a glaze, made from gum benzoin dissolved in alcohol. It is thought to improve the glaze to allow the alcohol to stand exposed a little while before adding to the gum.

In addition to the plain shellac polish, there is one made from 1½-oz. of shellac gum and ¼-oz. of gum sandarach, dissolved in ½-pt. of alcohol.

There are patent fillers, for filling is sometimes done on French polish work. Most frenchpolishers prefer plaster of paris mixed with water, with color enough to give the right shade. Note that the word "frenchpolisher" is used, not French polisher. If the wood has been overfilled with plaster, it will cause a great deal of extra sandpapering; hence it is advised to remove all surplus filler from the surface of the work before beginning the polishing process.

A good mahogany stain is made from dry Venetian red, crimson lake and raw umber, thinned with Japan driers, turpentine and a little raw linseed oil. A good and inexpensive cherry stain is made from one pound dry burnt Italian sienna, one quart turpentine, one pint Japan drier and a little boiled linseed oil. Apply with cotton waste or brush and wipe off surplus stain with dry rags. Walnut stain is made of dry burnt turkey umber, thinned with benzine, Japan driers and small quantity boiled linseed oil.

Creating Demand for Finishing Material

LITTLE varnish and other finishing material is bought on the basis of merit, comments the Furniture Manufacturer and Artisan, editorially. This fact is one of the undisguised scandals of the furniture making industry. The majority of the finishing material which goes into furniture is bought on the whim or caprice of the foreman finisher. In a good many cases the whim is governed by the size of the percentage paid to induce the master of the finishing-room to like or dislike a particular material, or to make it work or permit it to go wrong. The ultimate consumer of furniture knows mighty little about finish. There are a good many dealers who know no more than the ultimate consumer—and care less. If the article fresh from the factory looks good, and it sells, the dealer does not give it another thought. If the piece goes wrong, it is charged to careless use, or the blame is laid on the manufacturer who, so far as the average ultimate consumer is concerned, is a nebulous individual who lives somewhere, and makes furniture. He is so far away from the ultimate consumer that the ultimate consumer does not even venture to suggest that the dealer ask him to make good the failure or damage to the finish. And yet the difference in the finish of a piece of furniture may represent very largely the difference in the selling price between two pieces of furniture which may look almost exactly alike.

These are the conditions which confront the manufacturers of varnish, etc., of quality. They can sell their product at a percentage of selling cost—much or little. It is all a matter of competition—not of specific and certain merit and demand. Profits are cut both by competition and selling cost, including the percentage for influence. Because this is so and because it has an article of real merit to offer, one of the largest of the manufacturers of varnishes is about to inaugurate an extensive campaign, addressed primarily to the consumers, but at the same time to the dealers, in an effort to induce them to demand goods finished with its particular finish. Another manufacturer, in this particular issue, offers a similar article direct to the manufacturer. If the goods are of equal merit, both will profit by the general publicity campaign which is to be conducted by at least one of these manufacturers.

Any advertising, which is successful in educating the public which buys furniture, is work of the right sort. Quality counts. A very considerable, and an increasing percentage, of the public will buy good furniture if it knows what it takes to make up good and durable furniture. It is the recognition of this fact which has induced some of the manufacturers of casters to exploit their products where the general public will see and read. Finish is less tangible than casters, but serves here to illustrate. The public had to be educated to table locks. Manufacturers of so simple things as mattresses and springs have recognized this condition, but with exceptional foresight have first taken the dealer into their confidence, broken down barriers of opposition, and secured co-operation. The same thing must needs be done by the manufacturers of other materials used in furniture manufacturing. The manufacturers of gum lumber have illustrated this truth. They have talked direct to the makers of furniture, the architects and the interior trim men, while exploiting their wares with the ultimate consumer.—**Hardwood Record.**

Checks in Varnish and Wood

For the benefit of those in the glue room and those in the finishing room, who are continually wrangling with each other about the cause of the checking of finish on wood work, it may be said that both the varnish and the wood will check, observes a writer in Veneers. To put it another way, sometimes the fault is in the wood and at other times it is in the varnish itself. It is doubtful if everybody can always agree on just which it is that is at fault when checking in the finished face occurs. Still, a careful, analytical study of the work should furnish considerable light on the subject. If there is no sign whatever of disturbance or checking in the wood, and the varnish is rather heavy, and there is a fine cross-line checking on the outer surface, the trouble may generally be attributed to the varnish itself. Varnish, like wood, when put on in sucessive coats, may check in the process of drying out and shrinking together.

Also, sometimes in the making of varnish it may be short on some of the essential ingredients, and checking results, just as the end of a piece of wood will check at times in the process of rapid seasoning. On the other hand, no matter how good the varnish may be, if the wood is not thoroughly dry before it is used it will, in the process of drying out, check and cause trouble with the varnish. Generally when the checking fault is with the wood, the disturbance shows deeper, and also it should show checks running the direction of the grain of the wood, whereas the checking with faulty varnish is a series of fine criss-cross lines that in nowise follow the grain of the wood.

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

D. H. R. ENAMELS

We are getting out a new set of samples showing the various shades in French Grays and Ivories as well as White with a transparent Display Card showing the effect of the piece of furniture when finished.

You will find them very useful in showing your customer just what the goods will look like when finished. These are very original and will be sent on request.

D. H. R. SPRAY UNDERCOATS and SPRAY ENAMELS

have proved the most practical and satisfactory where you are equipped for spraying and our experience of several years in making goods best adapted for spray work relieves you of the necessity of experimenting with goods that have not stood the test of time.

Our Demonstrating Department is at your service.

Denny, Hilborn & Rosenbach
PHILADELPHIA

Oil Soluble Stain Powders

Try our latest and best production.

A perfectly Oil Soluble

Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Walter K. Schmidt Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

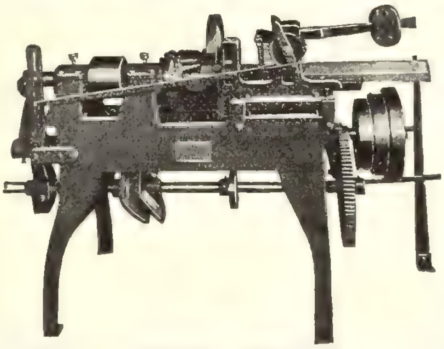
ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

The Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

Makes Wooden Plugs from Scraps



The demand for wooden plugs to jam the ends of big rolls of paper is much greater than the supply. The paper mills can't secure enough of them. This machine automatically makes 20,000 of these plugs in ten hours, from short stock and scraps around the plant. We have full particulars which we will be glad to send you. Testimonials? Yes, lots of them. Better write us to-day.

EAGLE MACHINE WORKS, 332 Market St.
Indianapolis, Ind., U. S. A.

"50"
FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and **does not show brush marks.**

R. C. Jamieson & Co., Ltd.
Established 1858
Montreal Vancouver

Owning and operating P. D. Dods & Co., Limited

OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

Veneers AND Panels

Economical Production in the Veneer Department

IT is unfortunately true that the glue room as a department of woodworking plants manufacturing veneered work, has been found in many cases to be absorbing some of the profits made on the operation of the other departments instead of paying its own way. In short, though a profit is shown when the total cost of manufacture is compared with the selling price, the profit is not so large as it would be were the glue room operated to the best advantage. It is chiefly on account of the peculiarities of glue that a great proportion of such losses occur. Temperatures must be right and proportions of mixing must also be right. As the care of the glue itself has been fully treated on of late, it is not necessary here to enter into that part of the case, but it will be worth while to consider the methods and operations involved in applying the glue and joining the wood. The final profit or loss on an operation depends on two things: the quality of the work turned out and the time required to do that work. The operation must be efficient enough to turn out a quality up to requirements, but must not consume so much time as to cause the wage bill to overtake its share of the selling price. As a rule it may be said that the quality is looked after by constant care during all the process of manufacture, while the quantity depends a good deal on the intelligence and forethought which governed the laying out of the plant before anything was first put in motion at all.

Take for instance the joining of face veneer before gluing up with the core. The old method of tacking down the pieces edge to edge with all joints tight, and gluing tape over the joints to hold them tight while the veneer is glued up with the core, is quite efficient as far as quality of finish is concerned. After the tape is sanded off the joint is almost indistinguishable, provided the color of the two pieces matched. But when the time taken by this method is compared with the time taken by a taping machine to do the same work, it is easy to discern a way in which the cost of production of veneered work may be cut. As is always the case, the first cost of such a machine is apt to stand in the way of its adoption. It is right that this should be so, for not all firms have really sufficient work to make it profitable to install a machine. On the other hand, it is worthy of consideration and investigation before a decision one way or the other is made. Reliable figures should be obtained on the cost of both methods.

Presses form another debatable item in the glue room equipment. In general use we find three types of press, hand-screw, power screw, and hydraulic. The hand-screw type is uneconomical to the last degree, unless the press work to be done is of a very intermittent nature. It is not, however, so easy to define between the usefulness of the power screw press and the hydraulic, as between that of the hand-worked press and power-operated presses, but it would seem that the hydraulic has the advantage of the power-driven screw machine in the matter of simplicity of construction and operation. Of course, a pump has to be used with the hydraulic press while the screw press is self-contained, but taking all things into consideration, under general circumstances it is the opinion of the writer that the hydraulic press is best of all types of press for the making of good veneer work.

The glue machinery, including heater and spreader, also requires some thought in selection and placing if the most economical production is aimed at. One of the modern ideals in woodworking machinery and one that has been upheld by recent articles on the subject of glue and its proper preparation and use, is the electric heater. It gives with comparative ease, results that can be obtained by other means, though not so easily, but it is not a thing that can be taken up even as readily as a taping machine. There is generally plenty of steam heat obtainable where electricity is held in the light of a luxury, at least as far as heating goes. But the fact of a fireless heater being out of the question is no reason why any old steam heater should be used. Look out for one that has a good control system and save spoiled glue. A modern heater should be equipped with a thermometer and efficient means for keeping the temperature at the required degree. The agitation device must receive its share of attention, as thorough mixing to keep the quality of the glue uniform throughout is very important.

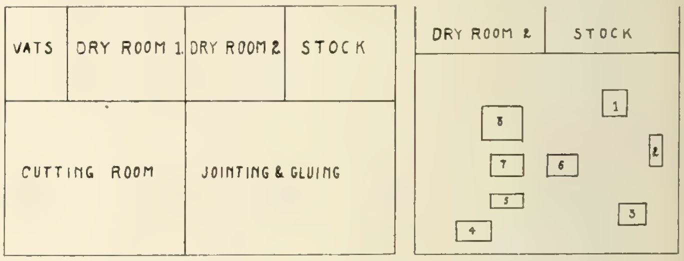


Fig. 1 (on the left) shows complete veneer department, and Fig. 2 (on the right) jointing and glueing room, with location of machines

Mechanical spreaders are in general use for large work and also for small work when done in large quantities. The variations in different makes of spreaders are not so very great, much depending on the care and understanding with which they are operated. Cleanliness around these machines is of great importance, while often enough one may see spreaders with glue all over and about an inch deep all over the floor. This is where the glue waste comes in. If, as some estimate it, fifty per cent. of the glue used in America is wasted, it is safe to assume that two-thirds of that waste occurs at the machine spreader, and that part of the balance of the waste is caused by the spreader putting on too much glue which is squeezed out in the press. Taking heater and spreader together it may be said that whenever convenient the heater should be mounted above the spreader so that the glue can be drawn direct into the reservoirs of the spreader without intermediate carrying in pails, which is just another cause of glue waste. For large panels it is imperative that both rolls should have separate reservoirs or all the glue will be laid on one end of one side while the other side may be evenly spread. Some grades of veneers are best suited by brushed glue and this forms one of the incidental matters which have to be looked after when they crop up.

Having considered the main items of the glue room equipment, let us proceed to the arrangement of the various units. No matter how good the plant may be its service can be reduced to the level of that given by very ordinary grades of machinery, if it is poorly arranged. Time is generally counted the most important division of the cost of production, and the object of all up-to-date methods and machinery is to cut the time necessary to do a given amount of work. Over and over again when work is to be let by contract it is the mill with the latest machine for that kind of work which is able to compete successfully. The doctrine of scientific management forms an ideal that can be followed in practice to a greater or less degree according to the desired application. In any case it is always well to start following that ideal when planning business in the first place, as it makes it so much easier to guide the workman into economical methods if his whole surroundings are laid out for the purpose.

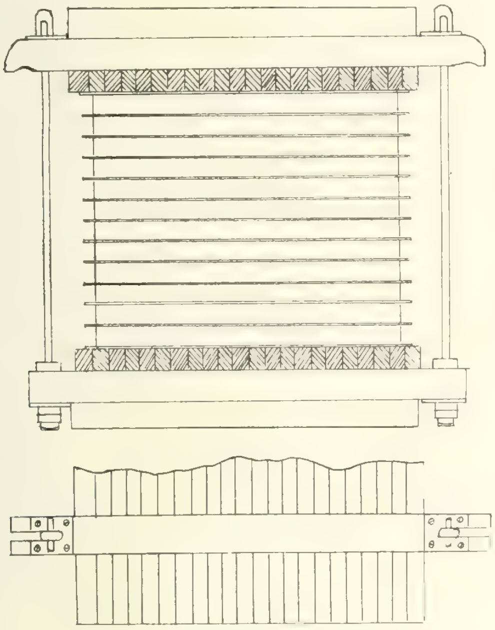


Fig. 3, Method of making retaining clamps.

Not all veneer users make their own veneer, and few make more than crossbanding stock, the face materials being shipped from the veneer mills. Therefore it will be useful to take as an example a veneer department intended for manufacturing crossbanding from the log and getting up finer materials from ready cut stock. As shown in Fig. 1 the whole department is divided up into two major portions, one for the manufacture of veneers and the gluing up, the first portion being subdivided to include a room for boiling vats and a dry room, as well as the cutting room. The second portion is also sub-divided into dry-room, stock-room and machine room. A chain-block running on an overhead rail is a necessity in a veneer department of the proportions of the one taken as an example, both in the cutting room and the glue room. In the cutting room it is used to raise to raise the logs from the vats and convey them to the rotary machine. In the glue room it lifts and carries loaded clamps from press to dry-room. In this type of plant the veneers are cut to size so that they will be ready to glue up as soon as dried. Drying is accomplished by piling vertically between strips in a special rack, so mad as to be removable from the dry-room or kiln for filling and emptying. In some cases where the ordinary dry-kiln is near enough the racks can be made to fit the kiln track, and a separate dry-room is then unnecessary. The stock-room attached to the glue-room should have if possible an earthen floor for the following reasons: The finer grades of face veneer are nearly always very thin and if all moisture is dried out of them they are certain to crack. Even thicker veneers will become so brittle if dried that they are easily broken in handling. An earthen floor always keeps the degree of humidity high in an enclosed space even in the summer months. The location of machines, benches, etc., in the glue-room is indicated in Fig. 2, which illustrates the glue room in detail.

The bandsaw is used to cut up and trim the veneers preparatory to jointing (if necessary). After jointing, the veneers are taped together in the machine, and are ready for gluing. The crossbanding material is the part that is glued, the assembling operation being carried out by laying first a face veneer, then glued crossbanding, then the core, followed by the second crossbanding and finally the finish veneer. The crossbanding is fed through the spreader, and the face veneers are laid on from 6-in. sketch. The core stock is trucked to the opposite side of 7. One man feeds the spreader and a second receives the glued stock and lays the cores. A third man lays the face veneers and cauls. Fig. 3 illustrates a strong method of making retaining clamps. The cross-pieces should be of hardwood about 3-in. x 3-in., while the face may be about 1½ in. thick and glued up from narrow width stock. Packing pieces are fixed to the backs of the cross-bars to give clearance for the heads of the bolts. The strain of the bolts must be taken on metal plates as shown, to prevent wear. Eye bolts with taper keys are the quickest set and released. About three thick washers should be provided in case of larger variation of thickness than the taper of the keys will take care of. The ends of two of the cross pieces of the upper clamp are lengthened and slightly hollowed to take a chain sling for moving the loaded clamp from press to dry room.

Dry room (2) is provided for the setting of the glue while the panels are in the clamps, and for further drying after the glue has set, by piling the panels between strips with pressure on the top. This is intended to reduce the liability to warp. This second dry room should not be kept so hot as the first, 80 deg. Fahr. being enough.

A further efficiency factor is an exhaust pipe to take away the steam-laden air from the glue room. Air full of steam and the smell of glue does not conduce to the health or vitality of the worker. After all it is up to the man to make good use of efficient arrangements to get results. The better the man is provided for, the better he will be able to keep things going smoothly.

That stain and varnish that is smeared around on the finishing-room floor will never improve the finish on furniture, and it will do but little good to the floor. In other words, the less of it the better for the cause.

Comparison of Sliced Mahogany Veneers with Sawed Stock

MANY observers have been interested in the prevalence of sliced mahogany veneers as compared with sawed stock. More slicing is done in the oak field, of course, than sawing, but the proportion prevailing in connection with mahogany is even greater than in the case of oak. Many veneer men, including those who operate both saws and slicers, have held to the opinion that the sawed veneer is the best product it is possible to put on the market; and assuming this to be true, the situation in regard to mahogany suggests the wonder that in the case of this aristocrat of woods an inferior method, if inferior it is, is used. Here, if at all, it would seem, is the place for the saw to be put to use.

A mahogany manufacturer, who operates a veneer plant in connection with his lumber mill, had some interesting remarks to make on this subject not long ago, and they are reproduced for what they are worth.

"We get only a small demand for sawed stock," he began, "and our saw is idle most of the time. On the other hand, the slicer is kept going constantly, and most of the veneers sold and in stock have been cut and not sawed. In the first place, the consideration that affects us is the loss of material. In the case of a high-priced proposition like mahogany, the loss in saw kerf has to be figured carefully, and amounts to so much that when we can get approximately the same results through the use of the slicer, and without any loss of material, we take advantage of the opportunity to do so. Care in consuming material is all the more necessary when it is remembered that in the case of a really mahogany flitch, with a figure that is out of the ordinary, the price it is possible to get is almost unlimited. I have even known of veneer manufacturers who were cutting up stock with a particularly good figure to glue the back board to another plank and keep on cutting until nothing whatever was left.

"On the other hand, I am free to say that I do not believe there is any marked difference in quality between mahogany veneers sliced and sawed. The sawed stock is perhaps easier to lay, and there is less danger of trouble; but with an experienced man gluing up the material I do not see any possibility for sliced stock causing disaster. One is about as good as the other, as far as my experience goes. The rupture of the fiber which is complained of when oak is sliced does not appear to be a noticeable factor with mahogany. The face of the material appears to be as sound after cutting as when manufactured with the saw. Consequently the slicer is the main dependence of this mill, both on account of the increased production we can get out of it and because of the reduction of the loss of material."

A veneer man handling all kinds of stock commented on this statement by saying that good sliced stock is about as good as sawed veneers, but that the range of quality in slicing is much greater than in sawing.

"The personal equation, so to speak," he said, "is almost unlimited in the operation of the slicer. If the veneers are well and truly cut, the stock will give as good service and stand up about as well as though it had been sawed; but if the work is not well done, the quality is far below that obtained through sawing. The burden is largely on the manufacturer, however. Much of the stock turned out by slicing that is poorly done is so badly torn that it cannot be used. On the saw, however, there is seldom any loss from this source, so that the thing evens itself up in a way.

"Sawed stock commands a much higher price than sliced. I believe that it is worth it, intrinsically speaking, and without comparing the actual cost of manufacture in each case; but I will admit that consumers seem to be getting away from the use of sawed stock in a good many cases, and so specifying slice-cut veneers, on account of the saving in price. As I produce both kinds, the change does not affect me particularly, but it is worth noticing, nevertheless."

It has been reported that there is an excess of sawed oak veneers on the market at present, though rumors of this kind are usually afloat at this time of the year. Whatever the facts in this connection, however, it would seem the part of wisdom among those whose equipment consists exclusively of saws to make the merit of their product plain to the consumer. If it is true that the latter is gradually drifting into the use of sliced veneers exclusively, the man who has only sawed veneers to sell is drifting with him into a rather uncomfortable position. The case for sawed stock is a strong one, but it has not been given as much attention as it deserves. The manufacturer who is in a position to supply either kind of material has not said much about the difference, and the consumer who has been able to get good results from slice-cut stock has pocketed the apparent saving and congratulated himself. If he has been wrong in his policy, it is up to the manufacturer of sawed veneers to tell him about it.

Getting back to the mahogany situation, it is said by manufacturers of lumber that many furniture manufacturers are using more solid material than ever before. It seems that the demand for a pronounced figure in mahogany, as in oak, is diminishing, and many high-grade furniture houses specify that the mahogany lumber they get shall have been "plain-sawed," meaning that it is to show little, if any, figure.

The manufacturers of popular-priced furniture, however, still want a marked figure, and for this reason are demanding veneers which show the patterns they desire to emphasize. In the case of this type of manufacture, the way the stock is cut is a minor consideration compared with the figure, while with the maker of high-priced furniture, who, it is declared, is now going into the use of solid stock, the question of quality is all-important. If he is continuing to use veneers, he is probably specifying sawed stock, or seeing that his panel man uses that kind of material; but according to the mahogany people, he is substituting solid material for veneered work.

Thus it seems that the panel men have an opportunity as well as the manufacturer of sawed veneers. If they are letting the trade of the maker of high-priced furniture get away from them—a statement which is open to considerable doubt, at least— it is because the latter has been considering the use of veneering as a means of getting particularly strong effects in figure, and because, no longer desiring this figure, he is discarding veneering along with it. Evidently he has not been fully convinced that veneered panels and tops are not only more beautiful, but also better constructed, and more certain to hold up under long and continued use If he has not been convinced, the panel industry should see that he at least has an opportunity to consider the facts.—Veneers.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB Reg U S Pat Off

Hoffman Bros. Co.

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS,

1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

- SPECIALTY

Indiana Quartered Oak

Sawed Quartered Oak Veneers

WHITE OR RED — HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

Pointers on Laying Veneers

ONLY to-day I saw rounded cross-band mahogany veneered moldings that gave the veneering department of the manufacturer a "black eye," says a writer in "Veneers." The taped joints were opened in some of the pieces 1/64-in. The core stock appeared to be perfect and the veneer was of high quality and had beautiful figures.

In some factories the job of taping veneers is done by cheap help. In many cases girls receiving $3 or $4 per week are intrusted with this important work. Paper tape is usually used, and this tape is applied to the face side of the veneer. After veneering, the paper is usually removed by an inexpensive boy, who soaks the veneer with hot water. The writer favors taping with a non-gummed muslin tape and applying the tape on the back of the veneer, gluing tape and all to the core. The tape is, of course, applied with glue.

I have no doubt but that some readers may seriously object to this, stating that it requires too much time to tape veneer by this process. I will admit that more time is required, but, after all, if properly done, you get a perfect job, and the additional time will amount to less than to remove the face tape, whether it is done by means of a sponge or sanding it off by the sand belt or sanding machine. If the outside face veneer is carefully soaked (not too much water applied), the small amount of soaking will do no particular harm; but after the veneer is once laid, and dried, the fewer subsequent wettings it receives the better.

Much trouble is experienced in the average furniture factory in jointing and taping end wood veneers, especially crotch mahogany and Circassian walnut. Some of the veneer men will take thirty or forty layers of veneer, place them between two boards, apply one or two handscrews, and joint this batch on a hand-power-feed jointer. The result is that the edges tear. Only a few pieces should be fastened between the boards, and the work can be satisfactorily done with a long carpenter's jointer. The joints must, of course, be made perfectly tight; tape can then be applied as already suggested.

Matching veneers requires experience. The most wonderful effects ever seen in furniture have been produced by artistic work in matching. Matching up veneers gives a balanced, symmetrical result which cannot fail to please. Mahogany can also be improved by careful work on the part of the matcher. Visit the large furniture stores and you will be surprised at the beauty of, for instance, the "tiger faces" of the Circassian walnut, which so very much improve the design and for which pieces of furniture the dealer charges a good price.

Cross-banding and face veneer should not be laid at the same time. Of course, I appreciate very well that the automobile dashboard manufacturer is compelled to do this, for the reason that he makes but a very small margin on these dashes, and it is quantity that counts. However, the furniture manufacturer should not do this. Cross-banding should be placed under pressure as soon after it touches the glue as possible, to prevent it expanding, and this cannot be done where the two are laid at the same time. Cross-banding should be thoroughly dry when laid, and the glue, after it has been applied to the core stock, should be allowed to stand for a few minutes before the cross-banding is placed in position.

The secret of laying end wood veneers is to treat your veneer as suggested in former articles—get the stock as thin as possible, lay it on perfect core stock (this term implies, dry well manufactured core stock), apply good veneer hide glue, and keep it under pressure until the glue is so firmly set that there is no danger of giving.

There is money in every business, if the business is managed in the right way. There is money in veneered furniture, but, as stated, the average manufacturer in this line is unscientific. End-wood veneers can be laid successfully.

Some time ago the writer asked a prominent piano manufacturer what success he was having in laying crotch veneer. He replied: "We do not use it, because it seems impossible to keep it from head-checking. We find that when a piece of mahogany veneer is particularly hard, and a crotch is used, it is impossible to hold it. We have even tried it extra thick, cross-banding, but the result has always been the same: sooner or later the checking shows. It may not show for a year, or two or three years, but it's bound to show in the end, and you know when an article is guaranteed, as we guarantee our pianos—that is, for ten years—we are called on to make good after a lapse of many years. Hence, we have cut it out, and are able to get along very well without it."

The manufacturer laying end-wood veneers must bear this in mind. The veneer must dry out and check all it ever will. Then the pores must be filled up until all the fibers are locked rigidly in place. Finally, it must never be allowed to swell again, in the laying or the subsequent finishing. If the veneer is properly treated and correctly laid, it will stand up indefinitely without checking or crazing, unless the veneered piece is allowed to become filled with moisture from long storage in a damp warehouse or cellar.

Uses of Veneered Tops in Furniture

NOT a few of the manufacturers of high-grade furniture assert that their veneering is of such an excellent type that the appearance of the joint is absolutely hidden and that observation of it is an impossibility. In the manufacture of solid tops for furniture one of the greatest difficulties is that of making invisible joints. Indeed it has been asserted that there is no such thing as a joint which cannot be easily detected without the aid of glasses. The use of veneered tops, correctly matched and properly glued up, does away with this trouble because it is a great deal easier to get a proper joint when veneers are used than when solid material is glued together. Open joints are discovered in veneered work occasionally, it is true, but it is also the fact that, taken as a whole, veneered tops are seldom found in this respect. The improved appearance of the veneered work on this score alone, not to mention the better matching that is possible through the use of thin stock for face work, should be a strong selling argument for veneer manufacturers.

Prominent users of veneers all over the country are anticipating the use of more veneered stock during the present year than in the year recently closed. The indicated increase is not large in every instance but the tendency is upward and general hopefulness prevails. Woods which show the largest increase in requirements are oak, mahogany, basswood, red gum, Circassian walnut, birch and chestnut. It is the tendency rather than the active increase that is the most encouraging feature of the outlook.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

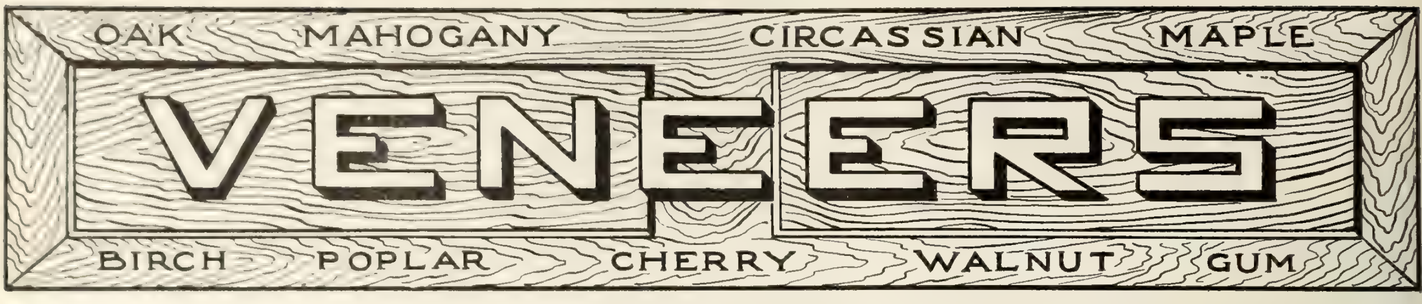
Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1 16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1 20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum.
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio



CIRCASSIAN WALNUT VENEER

Lot No. 1, 9 flitches, 16000-ft., average value 4 cts. per foot.
Lot No. 2, 13 flitches, 23100-ft, average value 2 cts. per foot.

A DISCOUNT OF THIRTY PER CENT

Offered First Cash Buyer.

HUDDLESTON-MARSH LUMBER CO., 2260 Lumber Street
CHICAGO, ILL.

Producers and Manufacturers

MAHOGANY Mexican, African
Cuba

CIRCASSIAN WALNUT
(Poti Wood)

East India Mahogany (Andaman Islands)

San Domingo (Direct Importation)

All Imported Woods in

LUMBER and VENEERS

Request our District Salesman to call
upon you with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,
Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - **Ohio**

We have here in Chicago the most modern and best equipped Veneer and Band Saw Mill in America

The first order will make you our permanent customer—Because :—

We manufacture right, so—
Our product is right.
We carry a large stock, so—
Our shipments are right.
We have a labor saving mill, so—
Our prices are right.

We Specialize in Oak and Mahogany Veneers, sawed and sliced. Also Quartered Oak and Mahogany Lumber

Let us know your wants

Fred W. Black Lumber Co.

2245 So. Crawford Ave., CHICAGO, U.S.A.

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for

Poplar and Red Gum Veneers and Crossbanding

H. C. HOSSAFOUS

MANUFACTURER OF

Sliced Quartered White Oak Veneer

Genuine Indiana and Ohio white oak logs, cut into flitches at our own plant, **perfectly smooth cut and dried flat** and without gloss.

We can help you solve your Sliced Oak Problems
Let us quote you on your Requirements

DAYTON, OHIO

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to
GENERAL OFFICES - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS
American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:
BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM
Quartered
3 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
3 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

RED GUM
Plain
4 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
1 " 10/4 "
2 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

THE FAMOUS CACHE RIVER GUM
Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.
Huntington, West Virginia

Sliced and Sawed Veneers

Quartered Oak and Mahogany

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

Write Us for Prices

Central Veneer Co.
H. J. BARNARD, Manager
Winter Ave. and Belt R.R.
Indianapolis, Indiana

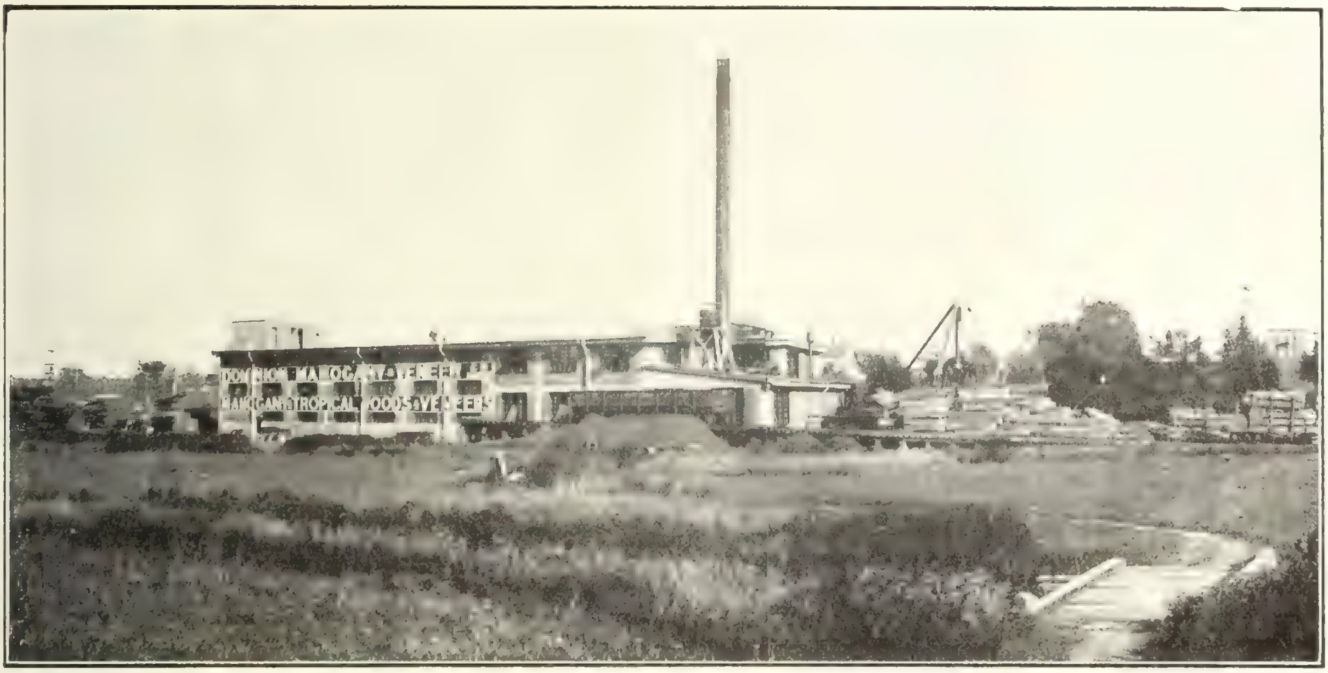
OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

The Dominion Mahogany & Veneer Co.

Limited



The Pioneer Mahogany Mill of Canada

LUMBER— African, Mexican, Cuban Mahogany, English Oak, Teak, Black Bean and Vermillion.

VENEERS—Sawed, African and Mexican and Cuban Mahogany, Maple, English Oak, American Quartered and Plain Oak 1/20″-1/4″.

Sliced, African and Mexican Mahogany, Circassian Walnut, Italian Walnut, Birch, etc. 1/24″, 1/20″, 1/16″.

ROTARY CUT— Birch, Maple, Ash, Gum, Poplar 1/24″-1/4″.

Drawer Bottoms and Pin Block Veneers and Door Stock.

MADE IN CANADA

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

Dominion Mahogany & Veneer Co., Limited

MONTREAL WEST, QUE.

The Hardwood Market

REPORTS from the hardwood trade would indicate that the situation at the present time is by no means rosy. The market would seem to have been affected to some extent by the Continent-wide money shortage and severe weather. From prominent dealers the impression is gleaned that hardwood men do not appear to be transacting the same amount of business so far this year as they have been accustomed to doing in past years. The quantity of hardwood taken from the woods during the past winter was probably about the same as in previous winters, but stocks in the hands of wholesalers and manufacturers are said to be light. Most furniture factories have again begun to consume large quantities of hardwoods and furniture manufacturers are said to display more interest, though most of the current buying is still for immediate purposes. Box manufacturers are doing a fair business with the result that there is a heavy movement of lower grades of cottonwood and gum. Oak is moving fairly well although there is not the fillip to the market that was anticipated with the opening of the spring season. Regarding prices, the tendency, to put it mildly, is slightly downward, a condition of things which may be due partly to increased production. Whether this is so or not the fact remains, nevertheless, that both buying and selling prices have been tending towards reduction of late, though no pronounced depreciation in this respect has taken place up to the present. There is a firm movement of 1-in. firsts and seconds birch and good lines of basswood are moving with encouraging progress. Maple appears to be in good demand and from reports there seems to be a good cut. The fact that hardwood men do not appear to be handling the same volume of trade as is usual for this time of the year would appear to be the chief reason why maple has not been so strong as has been the case in years gone by. Birch, like ash, is merely holding its own. White pine is in fair demand and the same may be said with regard to yellow pine. The outlook at present is not very bright, but it is hoped that the development which has begun in the building field will have the desired effect of bringing about a substantial increase in trade. The box and furniture factories are at present the best source of demand for hardwoods across the border. There is no doubt that a picking up of United States trade would influence in the right direction the Canadian market. With this assumption in mind we would certainly be sharers in whatever prosperity came to them.

Discussing the situation during the past couple of weeks the Hardwood Record says: "The general opening up of building weather will unquestionably stimulate demand from retail yards and, in fact, this stimulus has already been pretty widely noted and is the strongest point in consuming trade to-day. Orders are fairly plentiful and of good size and at prices which are, while not entirely satisfactory, at least at a reasonable level. The situation as it can be viewed, considering late developments in general business conditions, offers real encouragement which is based on a stimulus in inquiries above noted, the tendency to hold prices firm, more favorable situation in foreign conditions, applied to hardwood lumber in particular, and a general note of optimism which continues to be evident everywhere. It is, of course, true that big business is still holding the clamps tight, but it cannot be said that this policy is a result of anything more than a conservative regard for the tremendous investments which are involved. The general outlook bespeaks a necessity for steady continuance in a conservative way, but nevertheless presages a steady development in demand and a steadily augmented strengthening in prices."

The situation is summed up by the Southern Lumberman as follows: "Somewhat conflicting reports come from the East regarding the hardwood market, but in the Middle West a better movement is noted, due to expansion in demand from consuming factories. Quartered and plain oak are still selling best, with ash also moving well. Poplar is seasonably strong, and some improvement is reported in the call for gum. Other woods show little change one way or another. The warmer weather has been conductive to a better movement of yellow pine, and more encouraging reports are received from Louisiana, Texas and Mississippi mills. Trade in cypress is rather "spotty."

The Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

CONDITIONS in the hardwood and veneer trade, from the standpoint of the manufacturers of lumber and thin stock, have improved in immeasurable degree during the past thirty days. The furniture trade apparently got a late start this year, the slow development of spring weather likewise being a drawback, but most of the factories now appear to be busy, and this is having a good effect on the demand for lumber.

The business of the first quarter of 1914 was considerably below that for the corresponding period of 1913, according to reports which have been generally received. This is due to the fact that the late fall of 1912 developed a big demand for hardwoods, this demand running over into the fore part of 1913. On the other hand, the final quarter of 1913 was slow, and this had its effect on business at the beginning of 1914, which opened up rather slowly. However, each month of the year thus far has shown an improvement over the preceding month, and the lumbermen are hopeful that business will shortly be up to the maximum volume experienced at this time of the year.

General business conditions seem to have slowed up somewhat, and this is naturally affecting the lumber trade, which, on account of the widespread use of its products, is influenced as quickly as any other by underlying conditions. There seems to be no good reason for trade not being snappy and full of life; yet the fact remains that thus far it has dragged along, with the volume fairly satisfactory, but without the vim and go that usually characterizes business in this part of the world.

Quartered oak appears to be the "one best bet" of the hardwood men at present. The demand for all grades has been good, and the furniture trade has been using so much of the wood that the suggestion has been made that the vogue of mahogany is beginning to diminish. However, mahogany is such a staple that it would be hard for any other wood to dislodge it from its present place of popularity. Nevertheless, the mahogany market at present is not at all active, the demand is off somewhat and much lower prices than have prevailed heretofore are being quoted.

Situation Wanted

Fumed Oak Finisher wants position in good factory. Good on colors, an all round shader and finisher fuming box or otherwise. 15 years' experience. Yearly engagement preferred. Apply Box 33, Canadian Woodworker, Toronto. 4-5

For Sale

One Table Leg Machine, also one Dado Machine, well equipped, and in first-class condition. Apply to

THE M. F. BEACH COMPANY,
Winchester, Ont.
3-4-5

For Sale

British Columbia Timber, Limited, 125,000,000 feet, principally Fir, well watered, on improved river, very close to tide-water. Cruised by owner who guarantees quantity. Price $1.00 per thousand. Write to-day. J. W. Ney, 419 Pender West, Vancouver, B.C. 4

For Sale

Woodworking shop fitted especially for general work, such as interior trim, store and office fixtures, sash, doors, etc. New and up-to-date machinery recently installed. Blower system. First-class dry kiln. Railway siding. Situated in a thriving Ontario town. Owners well and favorably known to the trade and are doing a splendid business.

This is an exceptional opportunity to buy a bright business already established.

Apply to X Y Z,
C/o Canadian Woodworker, Toronto.
4

Veneer Agency

Large American manufacturer of veneers and thin lumber wants a representative to travel Ontario and Quebec on a commission basis. Exclusive territory. Apply Box 32, Canadian Woodworker. 3-4

Box Machinery Bargain

One Dovetail Machine.
One Setting Up Machine.
One Four Saw Trimmer—Self Feeding, made by Dovetail Machine Company, St. Paul, Minn.
One No. 22 Box Trimmer, made by Fischer Machine Works, Chicago, Ill.
All cost $3,300—Will sell for $1,000.

Inquire THE GLOBE SOAP COMPANY,
Cincinnati, Ohio.
3-4-5

7% INVESTMENT 7% **PROFIT SHARING**

Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

Stock Panels

We carry in our shipping room at all times a large assortment of stock panels, mostly 3-ply, ¼ inch thick, in **Plain Oak, Quarter Sawed Oak, Mahogany, Birch and Maple,** both one and two good sides from which we *can ship same day order is received.*

Veneer panel making is our specialty, and we claim that the panels we make are cheaper in the long run for they

Will not come to pieces after they are in the furniture

Do you see the point?

Send us your orders, or ask for Stock List

If we do not have on hand what you want, can build and ship promptly anything in 3 or 5-ply.

The
Gorham Brothers Company
Mt. Pleasant, Mich.

PATENTS

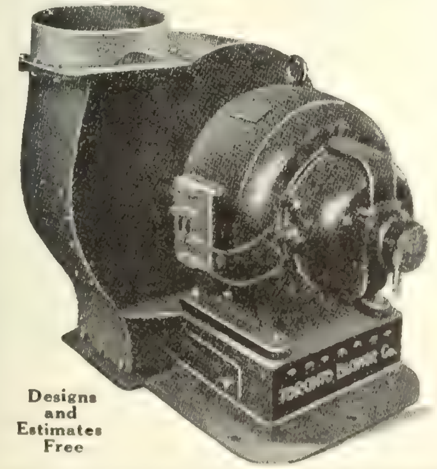
Herbert J. S. Dennison, **Patent Attorney and Expert**

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

PATENTS

STANLEY LIGHTFOOT
Patent Solicitor and Attorney
Canada $45.00 United States $65.00
Lumsden Building - TORONTO, CAN.



Designs and Estimates Free

REDUCE YOUR FIRE RISK

and Consequent Cost of Insurance

Increase the Efficiency of your Plant by Installing our Slow Speed Low Power

EXHAUST SYSTEMS

which carry off the refuse from machinery and feed combustible material to furnaces for fuel or deposit it into a suitable receptacle.

—**Improved Automatic Furnace Feeders**

Toronto Blower Co., 156 Duke St., Toronto, Ont.

Plain oak is quiet. Good plain oak especially is dull, and a good many dealers are overstocked. Consequently, as pointed out heretofore, some concessions are being made to move this accumulated lumber which are entirely out of line with the intrinsic value of the wood. Plain oak is now selling at $5 a thousand less than it brought a year ago, but business in this regard is improving rapidly. The writer believes that good plain oak at $50, f.o.b. Ohio river crossings, is the best buy in the lumber market to-day.

Chestnut remains a good seller. Manufacturers of furniture, as well as concerns specializing in the production of glued up panel stock, are buying it for core stock purposes, while there is a good demand for interior finish, this wood being especially popular for this purpose in the eastern part of the country, though not so strong in this direction further west. Sound wormy, naturally, is the easiest seller on the list, and stocks of this wood are well cleaned up. Basswood has been moving well lately, the demand for core stock being particularly good.

The continued demand for figured gum veneers, coupled with what promises to be a really startling come-back on the part of American walnut, has started the cry, "This is to be a brown wood period." Certainly with American walnut, Circassian walnut and figured gum all holding the center of the stage, the red part of the spectrum, which has been prominent by reason of the mahogany wave, is not likely to hold the undivided attention of the public. Walnut men are playing up the fact that 50,000,000 feet of the American wood are produced annually, and that there is ample supply for all demands. The rejuvenation of walnut in the furniture trade has already begun, and it is predicted that at the July shows it will be included in the line of nearly every leading maker of furniture in the States. This is given to Canadian members of the trade for what it is worth.

Toronto Cooperage Trade

A review of the cooperage trade in Toronto discloses a good demand at the present time for slack stage heading and hoops, while the demand is fair for some tight stock, although this line is not quite as strong as formerly. There is not a big demand in Toronto for tight stock as tight barrel making has fallen off a good deal. What demand there is is fully taken care of by the second-hand tight barrels which find a market here. Where the breweries formerly used 100-gallon tanks for ale storage they now utilize enamelled steel tanks instead. There is considerable repair work on tight barrels, kegs and vats, but not much new work. The trade last year on tight work was very slow and one of the worst years experienced by the trade. Practically all the ice-cream tubs are imported from the United States. The opportunity offers itself for coopers in Toronto to make washing machines for which there is a demand, these being manufactured on a large scale in Reading, Pa. These machines are good sellers and not difficult to put together as the stock can all be bought. The various industries using slack barrels are increasing and many new ones are springing up. There are a few good slack barrel plants in Toronto and in other cities, including Vancouver, Winnipeg, Hamilton, Montreal, Quebec, Ottawa, St. John, and Halifax. Some plants are making staves and heading for the trade, but the demand cannot be supplied and the call for stock is largely in excess of the productive capacity.

Natural Finish for Black Walnut

In endeavoring to analyze the reasons for the falling off in the demand for black walnut, it seems to be the consensus of opinion that it can be traced directly to wrong methods of finishing. No one will maintain that the old sombre American walnut furniture as it used to be finished in dull black tones, was really fitting for anything that was designed to furnish the abode of mankind, more specifically the home. The old wood finishers were laboring under some false idea of beauty or probably they did not investigate the possibilities of wood finishing to the extent that would enable them to turn out an article that would really be pleasing to the eye. It is really difficult to find any logical reason for the character of finish that used to be put on walnut furniture of various kinds.

However, this has all been changed. Even if the furniture and piano dealers and others actively engaged in marketing home furnishing products did not take an active enough interest or did not fully appreciate the potential possibilities in walnut, those whose money was invested in producing lumber and veneers of this wood have realized its possibilities and have given it close study. As a result they are gradually winning over the producers of furniture, interior finish, etc., to their way of thinking, and are gradually prevailing upon them to try out the market with modernized walnut products, so finished that they are really beautiful objects.

That their efforts are bearing fruit is absolutely proven by actual statistics regarding the production of walnut. Five or six years ago the output of walnut could be conservatively placed at 35,000,000 and 40,000,000 feet a year. One of the biggest manufacturers in the walnut business, a man whose fingers are on the pulse of the consuming trade and who is in a position to know what he is talking about, says that last year the production, figuring conservatively, was no less than 50,000,000 feet, of which 35,000,000 to 40,000,000 feet was exported. Thus it can be seen concretely that the actual production is increasing, and of course it is reasonable to suppose that this increase in production means an increase in demand as the outputs have been marketed.—Hardwood Record.

One is led to wonder how many planing mill workmen have been satisfied with the heating of their mill this winter. Too many owners are inclined to think that money spent to heat the mill is money lost. They do not consider the time expended by the men during the day in getting warm. On the other hand it may often occur that the engineer finds trouble in keeping up steam for the engine, and turns off the valve of the heating coils. The remedy is to make sure that the boiler capacity is ample for all probable demands when installed.

Oak from Japan is entering the European market at present in a volume said to be unprecedented and unparalleled. This oak is not only sold at less price than is the American article but it is claimed to be superior. Hardwod exporters agree that the entrance of this wood is injuring their business and that means must be found for pushing American oak and other woods more vigorously. A good deal of American capital is said to be behind Japanese oak, which is all hewn, and contains little sap.

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

Section of main floor Exhibit and Salesrooms

52 Lines
of New
Machinery
the Largest
Stock in
the World.

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

Profit in Window Frames

Machine does everything shown above.

May be secured in any planing mill by installing a

Perfect Window Frame Machine

The old method of making window frames by hand is comparatively expensive.

Our new machine so reduces the cost of making that a mill equipped with one can easily underbid any "hand-made" competitor and still make a handsome profit.

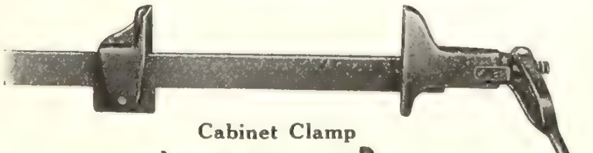
Send for our catalog.

Smith & Phillips Mfg. Co.

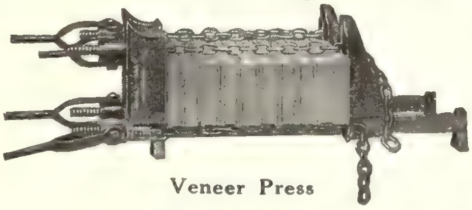
412-422 N. Sangamon Street, CHICAGO, ILL.

Better ask for particulars of our Stair Router, Edge Jointer, Sash Groover and Light Shaper, an ingenious and effective tool.

"Pioneer" Moulding Sander Power Veneer Presses

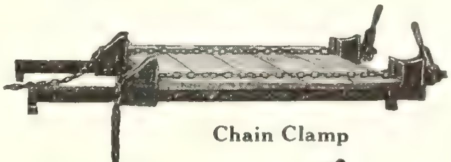


Cabinet Clamp



Veneer Press

Write for
Catalogue
and Prices



Chain Clamp

**Black Bros.
Machinery Co.**
Mendota, Ill.

Column Clamp

LISTEN

We are one of the largest manufacturers of special **Hardware for Store Fixtures and Show Case Manufacturers** in the World. Our latest catalogue fully describes every metal specialty you use in show cases and store fixtures. Send for a copy—It will save you money.

The Reflector & Hardware Specialty Mfg. Co.

Western Ave. and Twenty-Second St. - - - CHICAGO, ILL.

News of the Trade

The Curtis Aeroplane Factory, San Diego, Cal., are contemplating the building of an aeroplane works at Edmonton, Alta.

The site has been purchased for the erection of a sash and door factory at Cowansville, Que., for Messrs. Poulin & Bissette.

The contract has been awarded for the erection of a factory at Montreal for the Simonds Canada Saw Company, Limited.

The Interior Hardwood Finishing Company, Limited, has been incorporated as a limited company, with head offices at Victoria, B.C.

The Petrolea Wagon Company, Limited, have decided to purchase a large quantity of castings, wood, etc., for the manufacture of wagons.

The Canadian Sample House, Tillsonburg, Ont., contemplate the purchase of general store equipment. The manager is Mr. J. Deitelzweig.

The Canadian Casket Company are seeking a loan of $25,000 from the town of Wiarton with the intention of erecting a factory in that town.

The Canada Furniture Manufacturing Company are contemplating building a four-storey addition to their factory at Woodstock, at an expenditure of $15,000.

A building has been purchased for transforming into a branch of the Bank of Toronto, at Wyoming, Ont., and the purchase of bank fittings has been contemplated.

The plant and stock of the Rice Cigar Box Manufacturing Company, of London, Ont., was destroyed by fire which broke out on April 14. The loss amounted to about $26,000.

Messrs. Lynch & Bruneau, Limited, have been incorporated as a company with a stock of $50,000 for the manufacture of boxes, crates and packages, furniture and lumber.

The Restmore Manufacturing Company, Vancouver, are contemplating a further expenditure of $7,000 on their proposed mattress and furniture factory. The latter will cost over $150,000.

An hotel will be built shortly at Kingston, Ont., at a cost of $300,000 for Mr. George S. Balfour, 263 St. James Street, Montreal. The building will be five storeys and of fireproof construction.

With the intention of replacing the old building with a new structure to accommodate a box factory, the firm of Messrs. Langstaff & Shurg, of Emo, Ont., have purchased the old Czerwinski mill site.

The Toronto Lumber Company have let the contract for the building of a planing mill on Dartnell Avenue, at a cost of $2,000. The building will be one storey, frame construction, felt and gravel roofing and electrically lighted.

Work is proceeding rapidly on the erection of a new woodworking factory at Sackville, N.B., for the owners, Messrs. Coggel & Long. The building will be of frame construction, electrically lighted and steam heated.

A new company under the title of La Compagnie Industrielle de L'Original, Limited, has been incorporated for the manufacture and sale of furniture of all kinds. The chief place of business will be at L'Original, Ont.

The Bathurst Lumber Company of Bathurst, N.B., announce the completion of plans for the erection of a 50-ton sulphite pulp mill at Bathurst. The mills will be operated under the name of The Bathurst Pulp & Paper Company, Limited, with a $3,000,000 capital. Mr. Angus McLean, General Manager of The Bathurst Lumber Company, will be President of the new company, and Mr. A. G. McIntyre will be the manager.

Mr. H. V. Fralick, a well known citizen of Napanee, Ont., and a popular furniture traveller, died suddenly from heart failure at the age of 73 years. He was connected with the Gibbard Furniture Company, Limited, of Napanee.

The Montreal Box Board Company, Limited, has recently been incorporated to carry on the manufacture of boxes, barrels, cases and other products. The company has a capital stock of $500,000 and Montreal will be the chief place of business.

Tenders have been called for the supply of interior fittings for the Post Office at Comox, B.C., and will be received by the secretary, Mr. R. C. Desrochers, Ottawa, until April 27. The fittings include screen to public lobby, money order counter, drawers, etc.

The Port Stanley Manufacturing Company, Limited, has been incorporated for the carrying on of business as broom manufacturers, etc., at Port Stanley, which will be the head office. The provisional directors are Messrs. S. N. Cornell, H. Taylor and Chas. Findlay.

The ratepayers of Orillia, Ont., have passed a bylaw granting a loan of $50,000 to the firm of Messrs. J. R. Eaton & Sons, Limited, who are going to erect a woodworking factory in that town at a cost of $100,000. Plans for the building have not yet been prepared.

The contract has been awarded to Mr. John J. Smith, of Strathroy, for the construction of a woodworking factory at Strathroy, at a cost of $50,000. The Canadian Handle Company are the owners of the factory, which will be 180 ft. by 40 ft., brick and fireproof construction.

The Standard Pulp & Lumber Company, Limited, have been incorporated for the purpose of constructing and operating saw mills, manufactories and works for the preparation of lumber and all kinds of wood products, with a capital stock of $1,000,000. Montreal will be the headquarters of the firm.

Mr. Henry H. Gibson, founder and editor of the Hardwood Record, Chicago, died from heart failure on March 25. Mr. Gibson, who was a native of Camden, N.Y., and at the time of his death was in his 59th year, was an authority in hardwoods, having published a remarkable series of articles on American forest trees some time ago.

The Waterloo Town Council has agreed to submit a bylaw to the ratepayers at an early date providing for the loan of $50,000 to the Globe Furniture Company of Waterloo, Ont. A grant of a one-acre site will be made on condition that the company expends $125,000 in building and machinery. The building is to be four storeys, 48 ft. by 150 ft.

Mr. Harry French, who was employed in Mr. W. T. Glover's basket factory at Burlington, Ont., died on April 14 as the result of injuries received by falling into a vat used for steaming the logs in preparation for the peeling machine. He was endeavoring to roll the log to the vat with a cant hook when the hook slipped and he fell backwards into the vat.

What proves to be the largest furniture and house furnishing establishment west of the Great Lakes was opened to the public on March 23 at Calgary, Alta. The building has been erected for the Calgary Furniture Store, Limited, and the departments are sub-divided into sections for general, toy, office and institution furniture. The firm also go in largely for the manufacture of period furniture.

A important addition to the manufacturing industries of Vancouver Island is the establishment at Duncan, B.C., of a plant for the manufacture of interior hardwood finishings.

TIMMS, PHILLIPS & CO.
VANCOUVER, B.C. Limited

Write us for attractive prices on

Clear Douglas Fir
Clear Red Cedar
Clear Spruce

Also X X X Red Cedar Shingles

Canadian
Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer
603 Eastern Townships Bank Building
MONTREAL

The Atlantic Lumber Co.

Manufacturers and
Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers - TORONTO
Phone Main 6386

HOME OFFICE, BOSTON, MASS.
Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Well Manufactured Lumber

And Standard Grades
appeal to all careful
buyers.

A few items of such we offer here in thoroughly dry

3 car 4/4 No. 2 Com. and Bet. Soft Maple
2 " 6/4 No. 2 " Soft Maple
1 " 12/4 No. 1 " Soft Maple

3 car 6/4 No. 2 Com. and Bet. Soft Elm
2 " 8/4 No. 1 " Soft Elm
2 " 12/4 No. 1 " Soft Elm

Inside of 60 days we will be shipping from our New Stocks of ASH, BASSWOOD, BIRCH, ELM and MAPLE, and are ready to book orders for future shipments.

Steven & Jarvis Lumber Co.
Eau Claire, Wisconsin

B. C. Fir Timbers
and
Clear Finish Stock
Kiln Dried or Air Dried
Red Cedar Shingles
Write or Wire

W. G. Scrim Lumber Co.
Vancouver, B.C.

Plain Sawed Oak

Mills in West Virginia and Kentucky

Wilcox & Knapp
Conneautville, Pa.
Quotations Cheerfully Furnished

Buy Direct
From the Manufacturer
We are their Salesmen

The
Saw Mill Owners
Sales Co.
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston, New York, Watertown, Montreal, Quebec, Toronto

Ash
B.C. Doors
Birch
Basswood
Beech
Cherry
Cedar
Chestnut
Cottonwood
Elm
Fir Finish
Hickory
Hemlock
Maple
N.C. Pine
Oak
Poplar
Red Gum
Red Pine
Sap Gum
Spruce
Sycamore
Shingles
Tamarac
Timbers
Walnut
White Pine
Yellow Pine

We Solicit Your Inquiries

Seven acres were obtained and in addition to the factory housing accommodation will be provided in close proximity for employees. It is the intention of the company to open a store in Victoria for the sale of its products and also for the repairing of furniture. A special department is to be devoted to the manufacture of separators.

The manufacture of lumber is still a very important industry at St. John, N.B. There are ten large sawmills, besides other woodworking establishments, and the product of the mills is shipped to the United Kingdom, the United States, West Indies, South America, Africa and Australia. It is estimated that 61,000,000 feet of logs will be rafted on the St. John river at Fredericton this spring. In addition the mills at St. John carried over a considerable quantity of logs from last year. This will give the mills plenty of raw material for the whole season, and afford employment not only to the great number of men in the mills but to many others engaged in loading vessels.

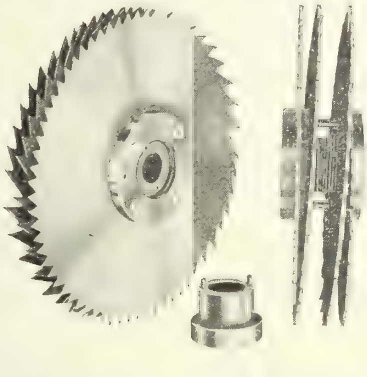
The Canada Furniture Manufacturers, Limited, Woodstock, have evolved a plan for the re-organization of the company's finances. The scheme as adopted by the shareholders involves the sale of the company's business and undertaking to a new company, which latter will be incorporated under the present or a similar name, the preferred shareholders in the old company receiving share for share of preferred stock in the new company, and in addition one ordinary share in the new company with each five preferred shares. The ordinary shareholders in the old company get one ordinary share in the new company for each two ordinary shares in the old company. The authorized capital will be $2,000,000 preferred stock, and $1,000,000 ordinary stock. The General Manager of the Canada Furniture Manufactures, Limited, Mr. J. R. Shaw, has great faith in the scheme and its bearing on the future development of the company.

Central Veneer Company's Model Plant

The manufacture of veneers is rightly regarded as one of the most important of the woodworking industries. Of the many modern factories spread over the American continent few are equipped with the same degree of completeness as is the Central Veneer Company's plant at Huntingdon, W. Va. This is one of the oldest poplar veneer manufacturing companies on the continent, being one of the first to make its entire output soft yellow poplar. In this respect it is claimed to be the largest veneer plant in existence to-day, turning out as it does a car every twenty-four hours; a record of which any firm might justifiably feel proud. The equipment of the plant, which was remodelled during the past year, is superb. Some of the features which characterize the operation of the plant are: the latest improved machinery, quick action in every department and an up-to-date electric power and lighting installation. The motto which the company has consistently followed throughout the twenty years of its business existence is that of the production of the best material, painstaking and careful workmanship, and the best service at moderate prices. Their timber stock is entirely of virgin growth, a constant supply of which is available for many years to come. This is a factor in any business which ought to commend itself to the average consumer. The company are catering particularly to the furniture and piano trade, and correspondence regarding the individual wants of consumers in these lines is particularly invited. The President, Mr. Wm. Seiber, has been connected with the veneer industry for the last thirty-five years, and he gives the business his personal attention at all times. The firm's Canadian representative is Mr. A. K. McIntosh, of 997 College Street, Toronto, whose wide and mature experience in the trade is unquestioned.

Trade FOX Mark

ADJUSTABLE



DADO HEADS

These heads, when open, cut a groove twice the width of groove cut with head closed, and they will cut absolutely any width between these extremes.

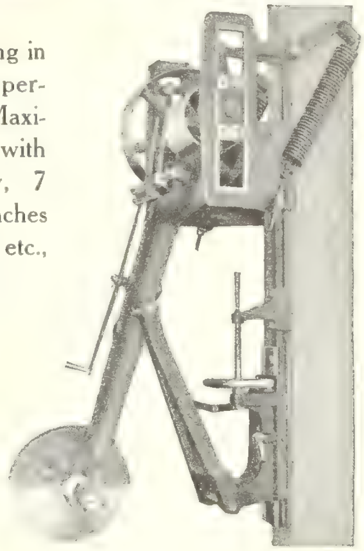
Write for Descriptive Literature

FOX MACHINE CO.

645 Front Ave., N.W., GRAND RAPIDS, MICH.

PRYIBIL No. 5 Parallel Saw and Groover

This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.



P. Pryibil Machine Co.

512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited

Hull, Quebec

Stewart-Greer Lumber Company

Band Mills
Mangham, La.

General Offices
St. Louis, Mo.

We ship direct from our own mills. All of our stock is **BAND SAWN**, cut from large Virgin Timber and well manufactured. We are in position to make immediate shipment of the following dry lumber:—

RED GUM
2 cars 1/2 1s and 2s.
20 cars 4/4 1s and 2s.
25 cars 4/4 No. 1 Com.

QUARTERED WHITE OAK
1 car 4/4 1s and 2s.

PLAIN WHITE OAK
15 cars 4/4 1s and 2s.
20 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.
5 cars 2-in. Bridge Plank.

SAP GUM
5 cars 5/8 1s and 2s.
8 cars 3/4 1s and 2s.
25 cars 4/4 1s and 2s.
12 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

PLAIN RED OAK
6 cars 4/4 1s and 2s.
15 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.
10 cars 2-in. Bridge Plank.

Archer Lumber Company

HARDWOOD LUMBER

Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards	28718
4/4 18 in. and up Panel	33905

Southern Red and Sap Gum

Our Specialty

Plain and Quartered sawn, and sorted for Mahogany or Circassian Finish. We guarantee our Gum to be as straight as any other wood. If you have used gum and had bad luck, let us talk to you about it, and if you have never used gum and desire a fine cabinet wood that will take any finish let us tell you how to get the best results. Also

Fine Figured Quartered White Oak

G. H. Evans Lumber Co.
Hardwoods and Pine
CHATTANOOGA, TENNESSEE, U. S. A.

Some Big Bargains in Nearly New Machinery

1—30-in. Double Surface Whitney Cabinet Planer, latest type, used less than six months.
1—Berlin Automatic Glue Jointer.
1—No. 3 American Back Knife Lathe.
1—Merrit Table Leg Machine.
1—24-in. Single Surface Planer "Holmes."
1—26-in. Single Surface Cabinet Planer "American."
1—4-Spindle Carving Machine.
1—American Variety Saw Table No. 1, with boring attachment.
1—16-nail Morgan Nailing Machine, double row chucks, double pair.
1—No. 129 American Hoyt fast feed Floorer.
1—No. 29 8-in. Fast Feed Floorer "Woods."
1—48-in. Berlin Royal Invincible Sander.
1—8-ft. Clemons Belt Sander.
1—12 x 16 Erie City Automatic Steam Engine.
1 Pair 80 H.P. Return Tubular Boilers, full fronts and fittings.

All above offered very cheap to save moving. Write at once. Full particulars by return.

Buffalo Tool & Supply Co.
40 Henry Street - - Buffalo, N. Y.

INDIANA HARDWOODS

Young & Cutsinger *Manufacturers and Wholesale Dealers*

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

OAK
Quality First Brand
GUM

Licking River Lumber Co.
114 Lumber Street
SOUTH BEND, INDIANA

Long-Knight Lumber Company
Circassian, Veneers, Mahogany
Hardwood Lumber
INDIANAPOLIS - - INDIANA

OHIO

Hardwood Manufacturers and Dealers

Distributing yards :—Baltimore, Md., Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co., CINCINNATI, OHIO.

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES.

THE

GOTSHALL MFG. CO.

TOLEDO, OHIO

Hardwood Manufacturers

We carry dry stock in

Quartered and Plain White and Red Oak,
Ash, Hickory, Cottonwood,
Sycamore, Cherry
Walnut & Poplar

cut from Northern Ohio timber

¶ We solicit enquiries for furniture, bending and wagon stocks, timber and piling. We have two Band Mills.

5/8″ Soft Yellow

POPLAR

Selected to Widths

7 to 11″ wide 18 to 23″ wide
12 to 17″ wide 24 to 28″ wide
29 to 37″ wide

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber—Hickory Axles

Charles F. Shiels & Co.

CINCINNATI, O.

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker". They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO

Mills:
Kentucky Tennessee
W. Virginia

—We make a specialty of—

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4

Wire our expense if in need of any of above stock.

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chesnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Write for a quotation on this space—it will put you in touch with hardwood consumers.

OAK and RED GUM

OUR SPECIALTY

At our Tennessee mill we are producing some choice

Plain and Quartered Red and White Oak. Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

Prompt Shipments and High Grades our Hobby.

Let us quote you on your requirements.

Mills—TENNESSEE
ARKANSAS

DUHLMEIER BROTHERS

Main Office & Yard
CINCINNATI, OHIO,
U. S. A.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sinker-Davis Co., Indianapoils, Ind.

BAND SAWS
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.

EDGERS (Gang)
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Bass Bros., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Anderson & Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Licking River Lumber Co., South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Sawmill Owners Sales Co., Montreal, Que.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Stevens & Jarvis Lumber Co., Eau Claire, Wis.
Stewart-Greer Lumber Co., St. Louis, Mo.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

JOINTERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Anderson Lumber Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.

MACHINE KNIVES
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Sidney Tool Co., Sidney, Ohio.
Smith & Phillips Mfg. Co., Chicago.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS
Bass Bros., New York.

SANDERS
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Bass Bros., New York.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

SAW JOINTERS
Diehl Machine Works, G. M., Wabash, Ind.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby Company, A. B., Toronto, Ont.
Sheldons Limited, Galt, Ont.
Toronto Blower Company, Toronto.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRINKLER EQUIPMENT
Keiths, Limited, Toronto.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Sidney Tool Company, Sidney, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WINDOW FRAME MACHINERY
Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE
Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

"Cabinet-Making"

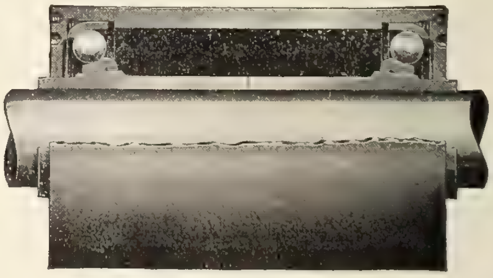
For the Worker in Wood, the Successful Teacher and the Ambitious Student.

By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room. The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS

HOLDS THE WORLD

BRAND
VEGETABLE

GLUE

HOLDS THE WORLD

SETS—STICKS—STAYS

From A Customer

"It is unusual to improve the quality and lower the cost at the same time—and yet this is what Atlas has done for us."

You Are Going to Use Atlas Glue Eventually

Our research department will continue to keep us as far ahead of the" just as good's" as we are right now; and the sooner you write us about your work and learn what we can do for you, the better off you will be.

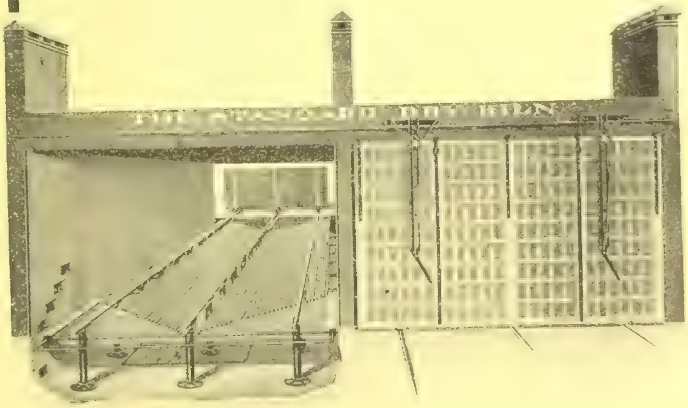
Quality First—Then Economy—Atlas Gives You Both.

National Process Company
Manufacturers
Indianapolis, Indiana, U. S. A.

IF SOMEBODY WROTE TO YOU

—asking your honest opinion of the make of dry kiln **you** use—you wouldn't "boost" it unless it was satisfactory, would you? That's why the strong endorsements of those who use The Standard Moist Air Dry Kiln **mean so much.**

If you are going to be in the market for new drying equipment soon, get our catalog and note how many concerns that dry **hardwoods** are users of The Standard Dry Kiln. Then write and ask **any** of them. For catalog, address: The Standard Dry Kiln Co., 1560 McCarty Street, Indianapolis, Ind.



"Wood's Saws are Good Saws"

Fred Wood & Son

SAWS

135 Richmond St. West,
TORONTO

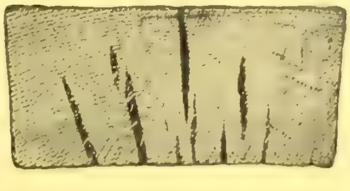
We specialize in the manufacture and repairing of fine Circular Saws for the use of Planing Mills and Woodworking Plants.

Every kind and form
of
DRYING LUMBER

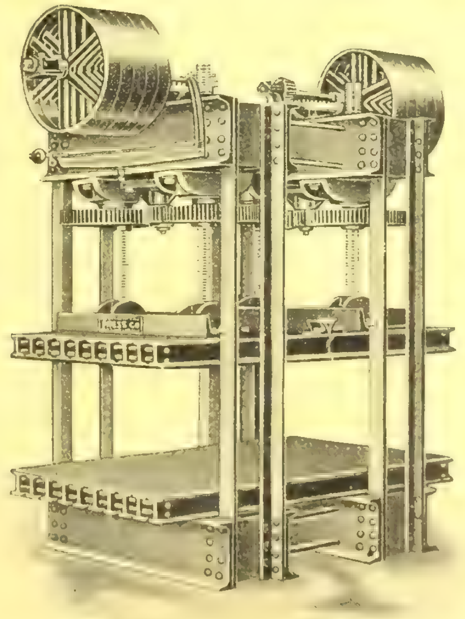
**Grand Rapids
Dry Kiln**

QUALITY DRYING

Grand Rapids
Mich. - U. S. A.



VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL

"I guess they're the cheapest in the end."

There is no doubt that Marietta finishes give better results with less work, and are more practical.

Our 1914 Process NON-FADING Mahogany Stain marks a real advance in wood finishing materials.

Our extra hard and impervious paste filler makes unnecessary and thus saves the cost of a "first coater."

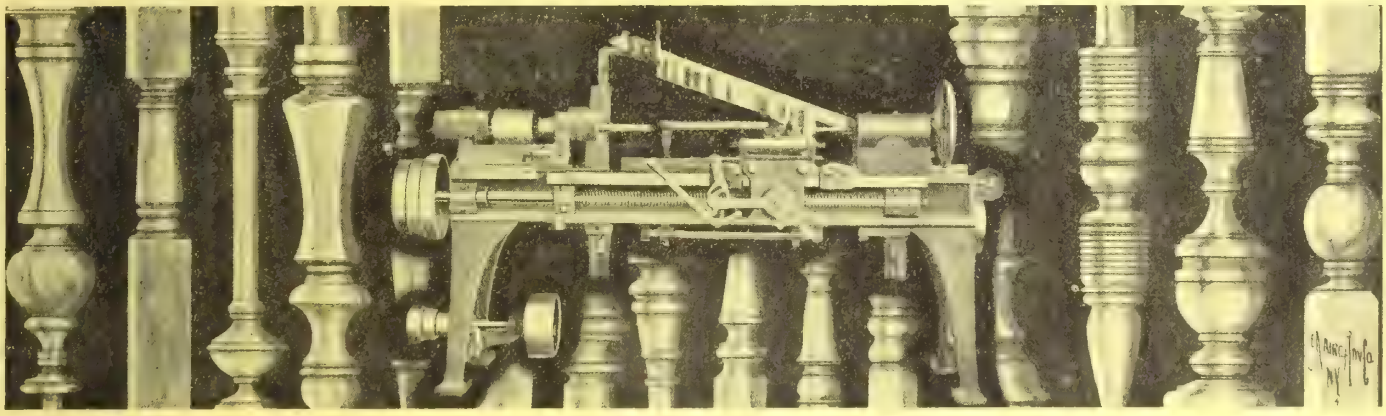
Samples on request.

THE MARIETTA PAINT & COLOR CO.
MARIETTA, OHIO

Volume Fourteen TORONTO, MAY, 1914 Number Five

CANADIAN WOODWORKER and Furniture Manufacturer

Where You Profit Most



Whether you make duplicate turnings as a specialty or to utilize waste—the proper gauge lathe insures success.

A Whitney Back-Knife Gauge Lathe

has a big working capacity—its speed means dollars earned—its accuracy means perfect reproductions of the back-knife pattern—the variety of turnings possible depends only upon the number of knives with which your Whitney Gauge Lathe is equipped.

The test of a gauge lathe is not on a few mechanical devices alone—but the machine's **complete adaptability to your work.**

We make the Whitney in four different sizes—20, 30, 40 and 50 inch. They turn stock up to 3 inches square.

The guiding of tools is done mechanically. The head and tail spindles are made of cast steel. Bearings are oil-flooded but oil cannot work out of boxes. The head center, instead of the tail center, is moved to clamp the work, which saves stock.

A quick way to find out how much **you** need this profitable Whitney Gauge Lathe is to send today to our nearest office for booklet.

Baxter D. Whitney & Son, Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives; Henry Kelley & Co.
26 Pall Mall, Manchester, England

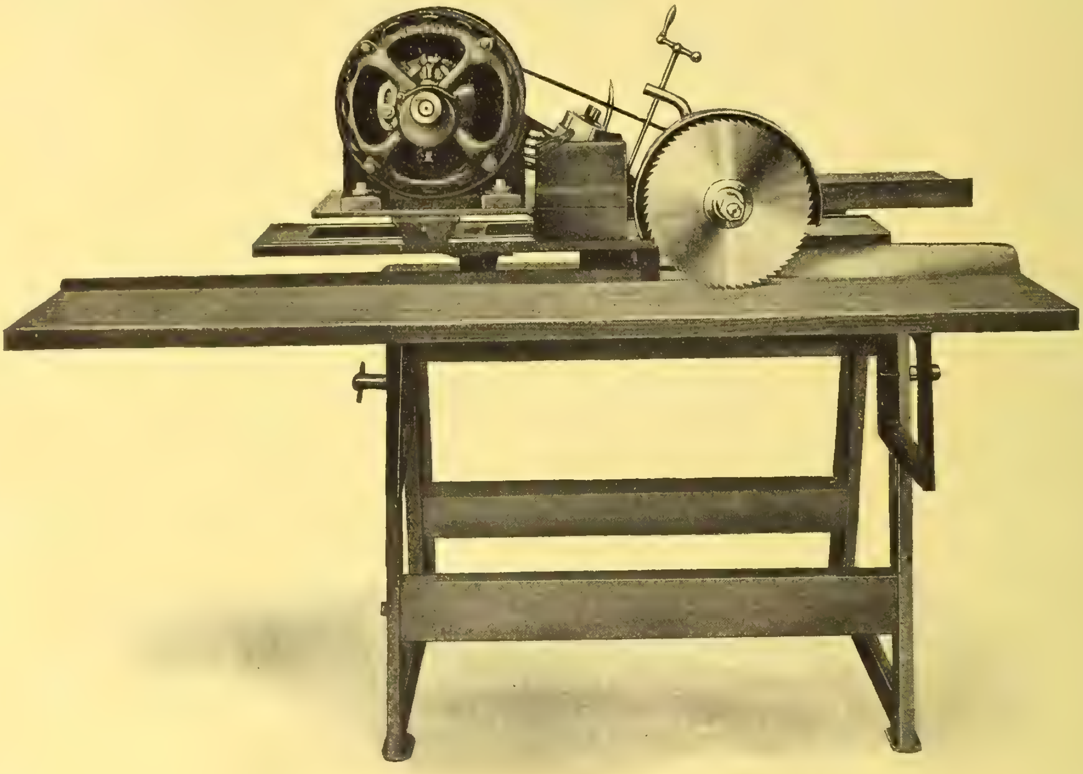
Alphabetical List of Advertisers, page 10

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders, Cabinet Makers, Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

Here are a few people who are using our machines :—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.

The following are representative letters from users of

Perkins Vegetable Veneer Glue

USED ONE YEAR—"Since using your glue we have had practically no trouble with loose veneers. This was our greatest source of trouble when using ———— Company glue. Furthermore we are economizing a good deal in our glue bills."

USED TWO YEARS—"We have been using your glue for some time now and take great pleasure in recommending it. It has been giving splendid satisfaction in every way and our relations with your firm have been exceedingly pleasant."

USED THREE YEARS—"We trust that our relations will be as satisfactory during the term of this renewal contract as they have been during the past three years."

USED FOUR YEARS—"If we had been using hide glue in our factory this winter we would have had to shut up shop, because it was impossible for us to heat our building and if we had used glue which requires heat in application, we could not have glued up anything."

USED FIVE YEARS—"Since going through your factory I can understand why your glue always runs absolutely uniform, and that is on account of the great care which you use in its manufacture"

USED SIX YEARS—"Mr. ———— said that if Perkins Glue had no cost or adhesive qualities above animal glue, which however he considered it had in both cases, he should not consider discontinuing its use because of the greater advantages and convenience of application, one of these being they could keep doors and windows open. Said they had no trouble and were perfectly satisfied with results obtained."

USED SEVEN YEARS—"We have just completed our figures on the cost of spreading glue at our North factory for the past year and while your guarantee was to save 20%, we find that we have gone considerably over this amount."

(We have many more that read like this.)

Let us furnish you the names of these customers to whom you can write for further information.

PERKINS GLUE COMPANY

Originators and Patentees of Perkins Vegetable Glue

809 J.M.S. Building :: :: SOUTH BEND, INDIANA

Your Opportunity Mr. Manufacturer

Don't miss this chance to secure some of the good things offered for immediate delivery. Many of the machines are absolutely as good as new. We must move them at once.

30 x 7 in. Baxter D. Whitney Double Surfacer, sectional rolls.
26 x 8 in. American double belted single Surfacer, No. 3.
24 x 8 in. E. B. Holmes single Surfacer, variable feed.
24 x 6 in. American single Surfacer, No. 2½.
24 x 6 in. Frank & Company Pony Planer.
24 x 5 in. Double Surfacer, Goodell & Waters.
16 in. Cigar Box Planer, double.

Planers, Matchers and Moulders

9 in. No. 129 Hoyt American Flooring Machine.
8 in. No. 29 S. A. Woods' Hardwood Floorer.
15 in. A.1. S. A. Woods. four side. six roll Planer and Matcher.
24 x 6 in. Frank & Company four side, six roll Planer and Matcher.
14 x 4 in. Keystone four side, six roll Planer and Matcher.
14½ x 6 in. Connell & Dengler four side, six roll Planer and Matcher.
14 x 6 in. Glencove "American" four side, six roll Planer and Matcher.
12 in. No. 110 S. A. Woods' Inside Moulder, five head.
10 in. American Rogers' inside Moulder, five head.
10 in. Rowley & Hermance four side, outside Moulder.
9 in. Rowley & Hermance four side, outside Moulder.
12 in. American Rogers' four side, inside Moulder.
15 in. American C.B. Rogers' four side Planer and Matcher.

Engines

200 H.P. Corliss Steam Engine.
90 H.P. Erie Automatic Steam Engine.
125 H.P. Clark Bros.' Automatic Steam Engine.
60 H.P. plain slide valve Steam Engine.
50 H.P. plain slide valve Steam Engine.
30 H.P. plain slide valve Steam Engine.
50 H.P. two-cylinder Gas Engine.
60 H.P. two-cylinder Gas Engine.

100 inch Dry Kiln Fan with Heater, containing about 10,000 ft. Pipe.
Slow speed Shaving Fan, 60 inch.
Other Fans all sizes and makes.

Box Machinery

54 inch Fay & Egan Band Resaw.
40 inch American No. 4 Combination Band and Resaw.
42 inch Band Saw, Connell & Dengler.
40 inch Band & Resaw, Fay & Egan, No. 4.
36 inch Band Saw.
30 inch Band Saw, Frank.
28 inch Band Saw, American.
Box Setting Up Machine, Morgan No. 1.
44 inch Circular Segment Resaw, Connell & Dengler.
Box Nailer, automatic, Morgan make, 16 nails.
Box Trimmers, Morgan.
Box Dovetailer or Lock Corner Culler, Connell & Dengler.
Self feed Rip Saws, Hoosier, Greenlee, Linderman, Holmes, etc.
48 in. Berlin Royal Invincible Sander, three drum.
36 inch Berlin Invincible three-drum Sander.
8-ft. Clemons Belt Sander.
4-ft. Adamite Belt Sander.
Double Cut Off Saw, American.
Double Cut Off or Equalizing Saw, American.
Iron frame Rip Saw, Holmes.
Iron frame Rip Saw, Frank.
Combination Saw, double arbor, White.
Variety Saw with borer, American No. 1.
Variety Saw or Dado Machine, Rowley & Hermance.
Variety Saw, cross and rip, iron frame and table.
Window frame or Pocket Machine, Smith & Phillip.
Boring Machine, two spindle, American.
Boring Machine, one spindle, Dennis.
Boring Machine, American No. 3.
Boring Machine, American No. 2.
Boring Machine, six spindle American.
Dovetailer, 12 spindle, Dodds.
Shaper, two spindle, No. 5 Frank.
Shaper, single spindle, Shimer.
Carving Machine, four spindle, Moore.
Embossing Machine, Union Toggles Joint.
Embossing Machine, Globe.

Buffalo Tool & Supply Company

40 Henry Street - Buffalo, N. Y.

Berlin

Economical Sanding Demands Both Types Of Sanders— Roll Feed and Endless Bed

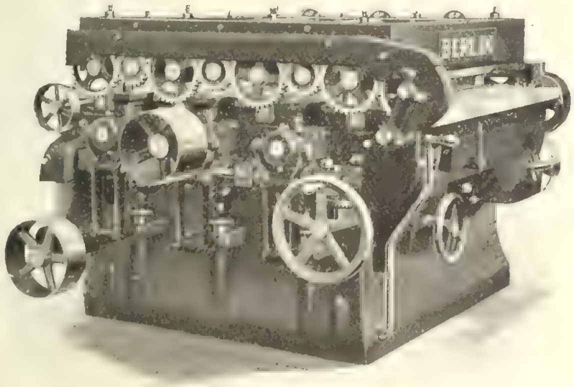
You get the maximum capacity of your roll feed sander only on long wide stock. On short, narrow stock fully 75 per cent. of the machine's actual capacity is lost because the rolls will feed only a limited number of pieces at one time. That is why economical sanding demands both types of sanders—roll feed for long, wide stock, and endless bed for short, narrow stock. The Berlin Endless Bed Sander will handle stock as short as three inches. The entire width of the bed is used, hence the greatly increased capacity of the Berlin Endless Bed Sander over any roll feed machine on small stock.

FOR LONG WIDE STOCK— ROLL FEED SANDER

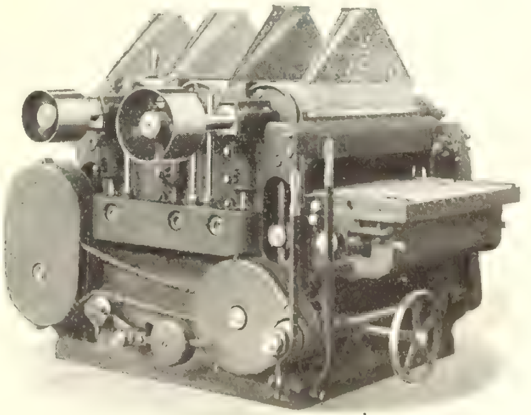
You can sand your long, wide stock, such as table tops, panels and interior trim, at lowest possible cost on the Berlin Roll Feed Sander. The rate of feed may be adapted to the quality of finish desired by simply adjusting one lever. In other words, the quick-change feed device on the Berlin Roll Feed Sander assures maximum production. This device is one of the patented design, and operating features on the Berlin Roll Feed Sander that cannot be had on any other sander ***at any price.***

FOR SHORT NARROW STOCK— ENDLESS BED SANDER

On short, narrow stock the Berlin Endless Bed Sander has several hundred per cent. greater capacity than any roll feed machine. And it will sand small pieces that the roll feed could not possibly sand. Stock smaller than three inches long may be sanded in forms. The small pieces you are sanding by hand or on belt sanders may be sanded on the Berlin Endless Bed Sander at a fraction of your present cost.



Berlin Roll Feed Sander



Berlin Endless Bed Sander

Investigate the earning power of Berlin Sanders. Mail your card request for complete data now—before you forget.

BERLIN MACHINE WORKS LIMITED, Hamilton, Ont.

Largest Manufacturers of Woodworking Machinery in the World

UNITED STATES PLANT, WITH OFFICES - - BELOIT, WISCONSIN

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

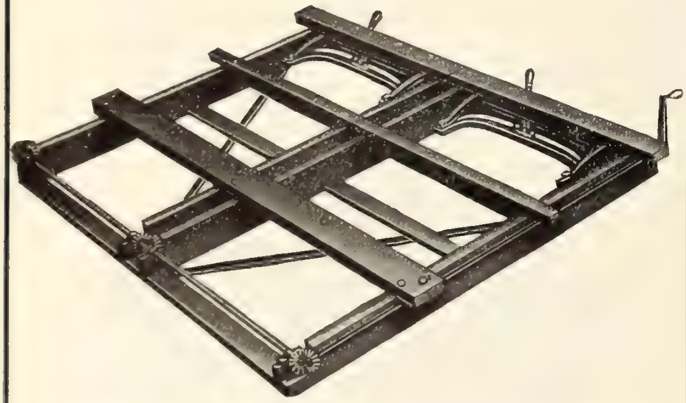
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.

1456 Front Ave. Grand Rapids, Mich.

Sanding Chair Legs Carborundum Brand Garnet Belts

The 100% Sanding Equipment

Good sanding machines properly cared for—good operators backed up by the best Garnet Paper and Cloth you can get and you will come mighty near to having the ideal sanding conditions.

Carborundum

Brand Garnet Paper and Cloth

Cut clean and quick—they are coated with Hard, Sharp, Clean Garnet that has the life.

They Cut the Cost of Sanding

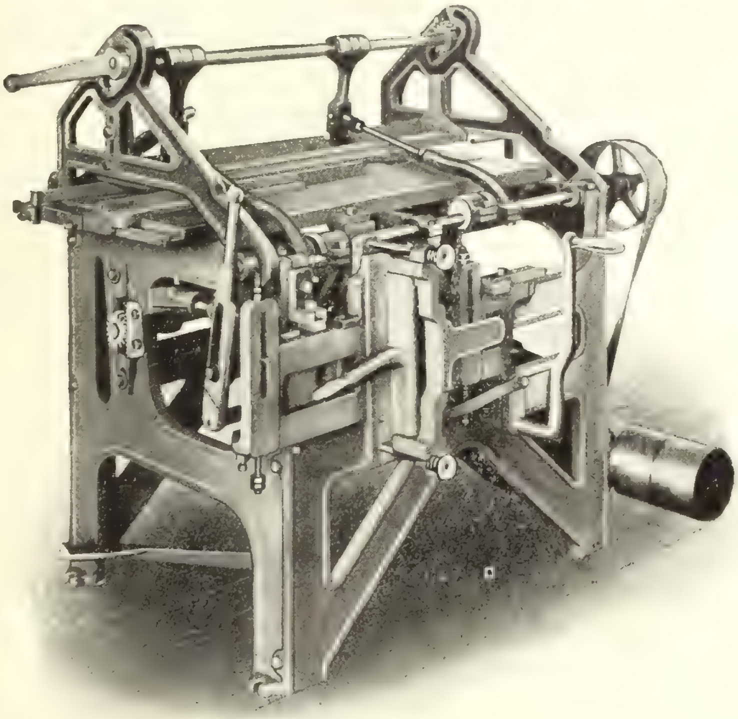
Every inch of paper and cloth, every bit of glue used in their manufacture, is of the highest possible quality.

Send for sample sheets.

THE
CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.
New York Chicago Boston Philadelphia
Cleveland Cincinnati Grand Rapids
Milwaukee

MACHINE MADE

WINDOW FRAMES



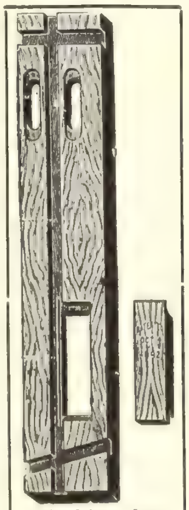
Perfect Window Frame Machine

A Machine-made Window Frame so far excels a hand-made frame that it is removed from competition.

Accuracy, Price, Quality and Quick Deliveries are the reasons.

Among the Canadian factories using our Perfect Window Frame Machine we mention the following:

Riverside Bros. Company,	Calgary, Alta.
Western Planing Mills Company,	Calgary, Alta.
Rendall, Mackay, Michie, Limited,	Edmonton, Alta.
Terminal Construction & Mfg. Company,	Vancouver, B.C.
Royal City Planing Mills Company,	Vancouver, B.C.
J. Hanbury & Company,	Vancouver, B.C.
Western Sash & Door Factories,	Vancouver, B.C.
Westminster Wood Working Company,	Westminster, B.C.
G. W. Murray,	Winnipeg, Man.
Rat Portage Lumber Company,	Winnipeg, Man.
Winnipeg Paint & Glass Company,	Winnipeg, Man.
J. & D. A. Harquail Company,	Campbellton, N.B.
Haley Bros. & Company,	St. John, N.B.
Chappell Bros. & Company, Limited,	Sydney, N.S.
The Pringle Company,	Belleville, Ont.
Bryan Manufacturing Company, Limited,	Collingwood, Ont.
L. A. De Laplante Limited,	East Toronto, Ont.
M. Brennen & Sons Mfg. Company,	Hamilton, Ont.
Patterson Tilley Company,	Hamilton, Ont.
James Lunny & Company,	Hintonville, Ont.
S. Anglin & Company,	Kingston, Ont.
Davidson & Thackray,	Ottawa, Ont.
W. C. Edwards & Company,	Ottawa, Ont.
S. L. Kyle,	Ottawa, Ont.
The McAuliffe Davis Lumber Company,	Ottawa, Ont.
J. McLaughlin, Ottawa Stair Works,	Ottawa, Ont.
J. M. Green & Son, Limited,	St. Thomas, Ont.
Tillson Company, Limited,	Tillsonburg, Ont.
George Rathbone,	Toronto, Ont.
J. C. Scott Company,	Toronto, Ont.
John B. Smith & Sons,	Toronto, Ont.
R. J. Batt,	West Toronto, Ont.
Toronto Junction Lumber Company,	West Toronto, Ont.
John Piggott & Sons,	Windsor, Ont.
D. G. Loomis & Sons,	Montreal, Que.
Wm. Rutherford & Son Company,	Montreal, Que.
F. Tremblay & Son Company,	Montreal, Que.
Tobin Manufacturing Company,	Bromptonville, Que.



Machine does all the work shown in above cut.

Often a large interior finish contract hinges on your ability to make quick delivery. With our Perfect Window Frame Machine you can outbid the man who uses old-fashioned methods in points of

TIME

PRICE

AND

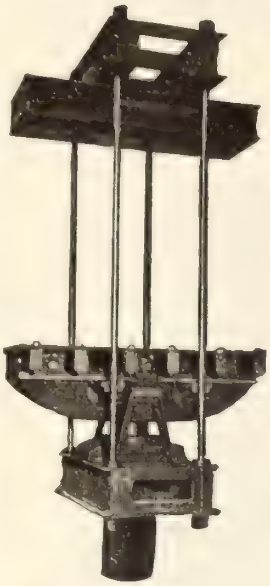
QUALITY

Write us for particulars

Smith & Phillips Mfg. Company

412-432 N. Sangamon Street, CHICAGO

Hydraulic Veneer Press

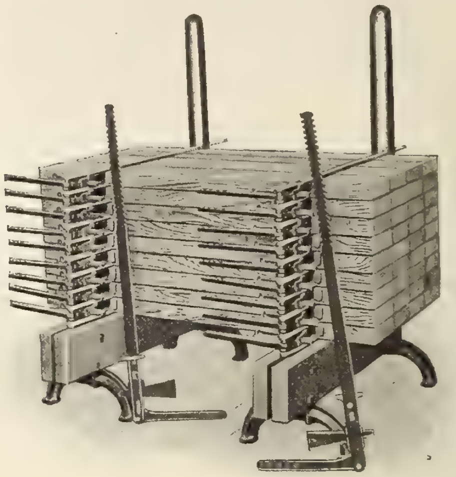


We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

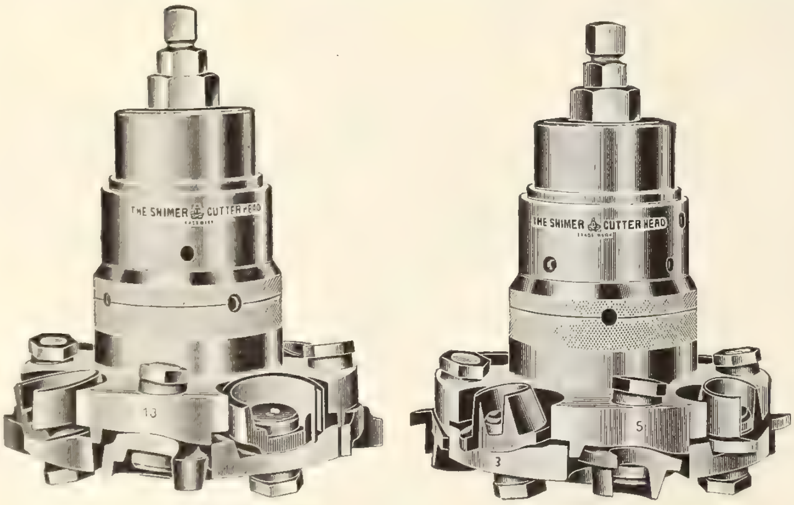
CLAMPS THAT CLAMP



We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

Send for Complete Catalogue

A. E. PALMER & SONS
OWOSSO, MICH.



The Shimer Limited. Price $72.46 per set complete.

Guiding the Mill Man to Larger Profits

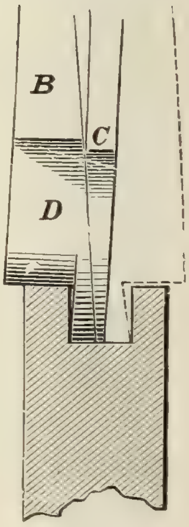
Our work consists in helping mill men to increase the quality and volume of material turned out, by furnishing them with **tools which do more and better work with the same labor and power costs**

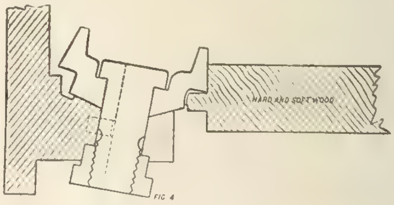
The Shimer Cutter Heads of today are the logical product of years of experience and unexcelled facilities for manufacturing them. They offer exceptional advantages for the economical manufacture of Flooring, Ceiling, Siding, Wainscoting, Ship Lap, Door and Sash Patterns, etc. They are designed in sizes, styles and plans to meet any planing mill problem that Cutter Heads can solve.

The Shimer Cutter Heads cut fast and clean because the Bits work with a **divided shearing cut and have** plenty of point and edge clearance. (See diagram). The bits are set on the Head in such a manner that only their cutting edges come into contact with the lumber, **preventing friction in the cut** and the consequent heating of the Bits and burning of the **lumber.**

Each Bit is seated to line up perfectly, presenting self-clearing bit points to make easy the matching of any and every variety of knotty, and cross-grained single tongue and groove flooring. The cutters retain their natural cutting position on the Head and work as well after years of service as when new.

Consider these points of merit and let us have your order today for such tools as you can use.





Address: SAMUEL J. SHIMER & SONS, Inc., GALT, Ontario, Can.

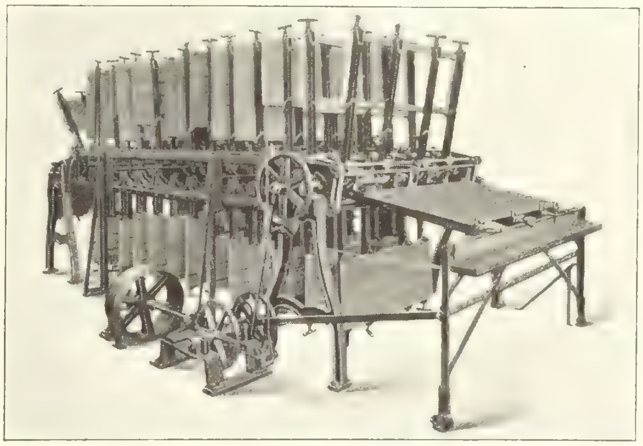
Patented Nov. 29, 1890
July 19, 1912

A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co. Toronto
Williams & Wilson Montreal
Canadian Agents

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

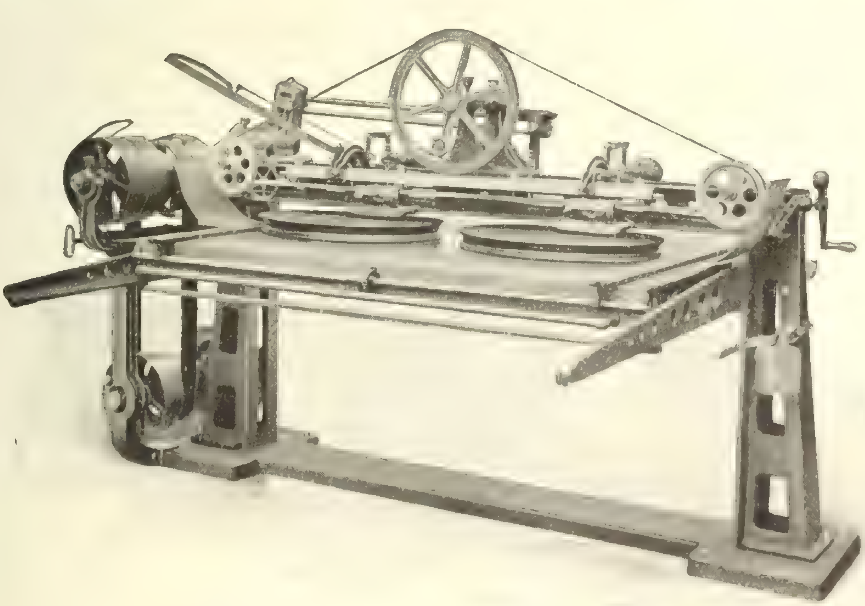
Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

Moore Universal Rubbing Machine



The labor saving advantages of this machine are apparent in the accompaning illustration.

The action of a flexible guiding bar ensures a uniform finish throughout. Any required amount of pressure is obtained by an automatic device on the machine.

The accomodation of this machine is for cases up to 39 inches high or stock 6 feet by 8 feet.

The floor space required is 10 ft. x 10 ft. for the 8 foot machine and 10 ft. x 12 ft. for 10 foot machine.

May we send you literature?

CURTIS MACHINE CORPORATION, Jamestown, N. Y.

Alphabetical List of Advertisers

Acme Veneer & Lumber Company ... 47
Adjustable Clamp Company ... 10
Andrews Company, A. H. ... 55
Archer Lumber Company ... 60
Atlantic Lumber Company ... 57
Ault & Wiborg Company ... 41

Berlin Machine Works ... 5
Billstrom, Nels. J. ... 9
Black Bros. Machinery Company ... 55
Black Lumber Company, Fred W. ... 49
Buffalo Tool & Supply Company ... 4

Canada Machinery Corporation ... 14
Canadian Boomer & Boschert Mfg. Co. ... 67
Canadian Linderman Company ... 11
Canadian Morehead Manufacturing Company ... 4
Carborundum Company ... 6
Central Veneer Company ... 48
Central Veneer Company ... 50
Chapman Double Ball Bearing Company ... 66
Chicago Machinery Exchange Inc. ... 55
Cincinnati Veneer Company ... 49
Clark Veneer Company, Walter ... 48
Curtis Machine Company ... 9
Cyclone Blow Pipe Company ... 12

Dennison, Herbert, J. S. ... 53
Denny, Hilborn & Rosenbach ... 40
De Vilbiss Manufacturing Company ... 41
Diehl Machine Works, G. M. ... 12
Dominion Mahogany & Veneer Company ... 51
Duhlmeier Brothers ... 63

Elliot Woodworker, Limited ... 2
Evans Lumber Company, G. H. ... 60

Fox Machine Company ... 59
Francis Company, Chas. E. ... 60

Gorham Brothers Company ... 53
Gotshall Manufacturing Company ... 62
Grand Rapids Hand Screw Company ... 6
Grand Rapids Veneer Works ... 56

Haughton Veneer Company ... 45
Hoffman Bros. Company ... 45
Huddleston-Marsh Company ... 49
Huther Bros. ... 9

Jamieson & Company, R. C. ... 39

Keiths Limited ... 13
Kosse, Shoe & Schleyer Company ... 62

Licking River Lumber Company ... 61
Lightfoot, Stanley ... 53
Long-Knight Lumber Company ... 61

Marrietta Paint & Color Company ... 68
Meakins & Sons ... 39
Morton Dry Kiln Company ...

Nash, J. M. ... 67
National Process Company ... 67
National Securities Corporation ... 53
National Veneer & Lumber Company ... 48

Ober Manufacturing Company ... 39
Ohio Veneer Company ... 45
Ormsby Company, A. B. ...

Palmer & Sons, A. E. ... 8
Penrod Walnut & Veneer Company ... 50
Perkins Glue Company ... 3
Perrin & Company ... 8
Powell-Myers Lumber Company ... 61
Pryibil Machine Company, P. ... 59

Reflector & Hardware Specialty Mfg. Company ... 55
Robertson Manufacturing Company, P. L. ... 13

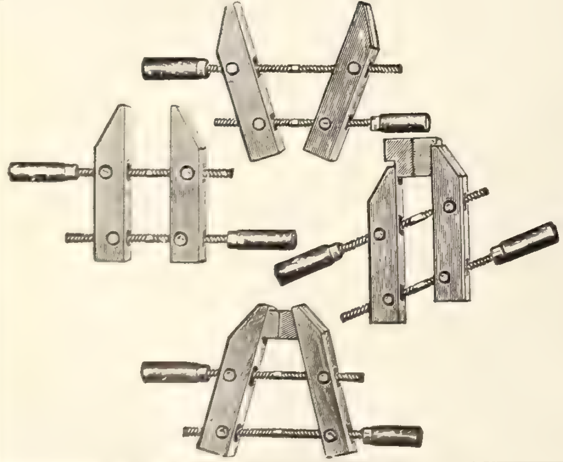
Saw Mill Owners Sales Company ... 58
Schmidt Company ... 41
Scientific American ...
Scrim Lumber Company, W. G. ... 57
Shawnee Lumber Company ... 63
Sheldons Limited ... 12
Shiels & Company, Chas. F. ... 62
Shimer & Sons, Samuel J. ... 8
Sidney Tool Company ... 13
Simonds Canada Saw Company ...
Smith & Phillips Manufacturing Company ... 7
Spencer, C. A. ... 57
Standard Dry Kiln Company ... 67
Stevens & Jarvis Lumber Company ... 57
Stewart Greer Lumber Company ... 60
Strong Veneer Company ... 6

Thompson & Company, Lewis ... 48
Thompson Veneer Company, W. T. ... 45
Thompson Hardwood Lumber Company ... 63
Timms, Phillips & Company ... 57

U. S. Steel Tank & Pipe Company ... 12

Walters & Sons, H. ... 59
Wardell Manufacturing Company ...
Whitney & Son, Baxter D. ... 1
Wilcox & Knapp ... 57
Wood & Son, Fred ... 56

Young & Cutsinger ... 61



The Jorgensen Adjustable

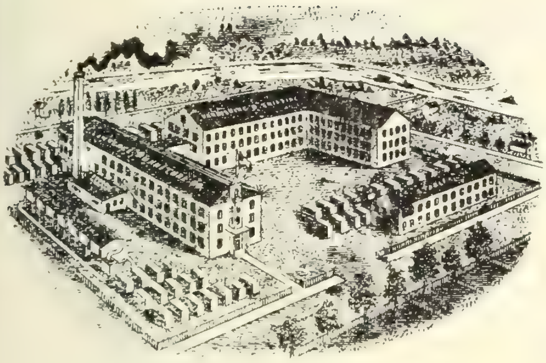
is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company
215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng, Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.

THOS. CROKETT,
PRESIDENT.

OCT LAURIN
MANAGER



The St Lawrence Furniture Co.
WHOLESALE
Furniture Manufacturers

RIVIERE-DU-LOUP, QUE.
CANADA.

April 16th, 1914.

The Canadian Linderman Co., Ltd.
Woodstock, Ont.

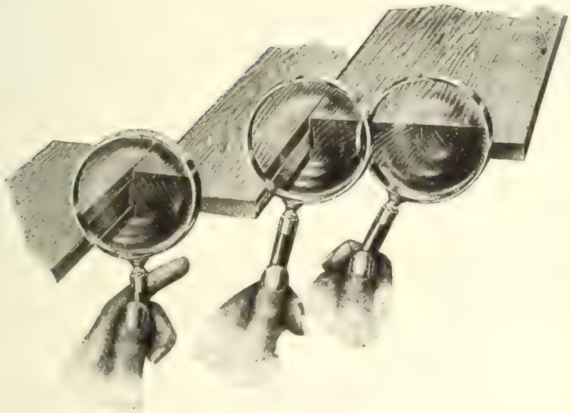
Gentlemen :

After having used one of your Linderman 6′ Dovetail Glueing machines for over 20 months, we are pleased to say that it has given the best of results. We are satisfied we save the purchase price of the machine each year ; saving about 7% on the lumber ; two men's time, and considerable glue. The upkeep of the machine has been very small taking into consideration the amount of work it does.

Were we without one and knowing all we know about it we would order one without delay.

Yours very truly,

St. Lawrence Furniture Co.
Per Oct. Laurin
MANAGER.

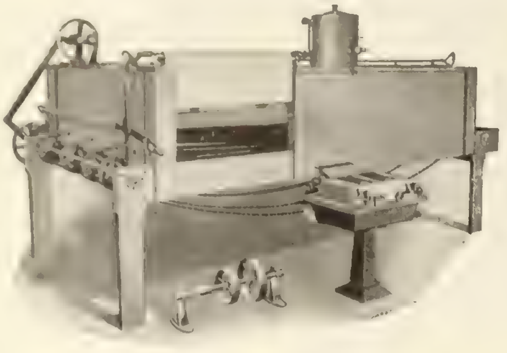


The above expression is only one of forty five satisfied purchasers of Linderman Dovetailers in Canada. We can save you money—let us tell you how much.

Canadian Linderman Co., Ltd.

FACTORIES :

Woodstock, Ont. **Muskegon, Mich.**



Automatic Stock Heater and Conveyor

Your Glue Room

We are specialists for the Glue Room. We manufacture everything needed to make it complete. Our equipment is designed to give **Speed—Endurance —Economy**—and includes Glue Jointers, Stock Heaters, Patent Glue and Water Scales, improved Glue Heaters, Glue Spreaders and Glue Clamps, besides a complete line of Cutter Heads.

Tear out this page, put your name and address on the margin, mail it to us, and we will gladly send you our complete catalog.

The Diehl Machine Works

On the Banks of the Wabash **WABASH, IND., U.S.A.**

U.S. STEEL TANK & PIPE CO
CANALPORT AVE & HALSTED ST
CHICAGO ILL U.S.A.
ENGINEERS & CONTRACTORS
FOR
SHAVINGS & DUST
EXHAUST SYSTEMS
SLOW SPEED
COLLECTORS
AND
FANS
ETC

Maximum Service

Minimum Repairs

The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

(Patented)

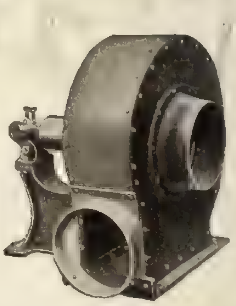
Cyclone Blow Pipe Co.

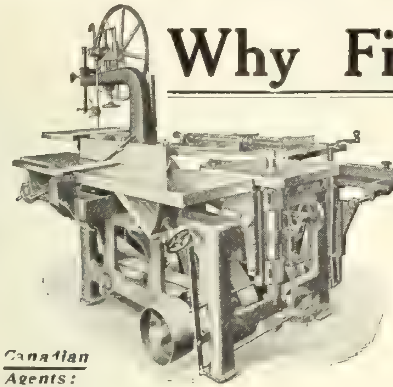
Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.





Why Fill Your Shop With Machinery?

The 1914 Model Famous "31" Universal Woodworker combines 16 machines in one and does 31 kinds of work.

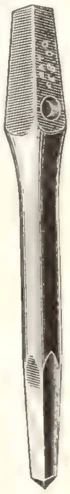
Saves 50 to 100% in first cost, floor space, power, cost of installing and upkeep.

New Catalog No. 25 for 1914 tells all about the "31" and over 50 other money makers for Woodworkers. It's free.

THE SIDNEY TOOL CO., 250 Highland Ave. **Sidney, Ohio, U.S.A.**

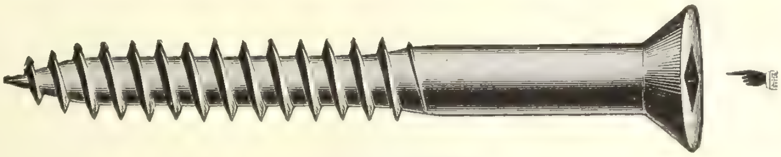
Canadian Agents:
The A. R. Williams Mchy. Co., Toronto: Bournival & Co., Montreal: The A. R. Williams Mchy. Co., Winnipeg: The A. R. Williams Mchy. Co., Vancouver

---



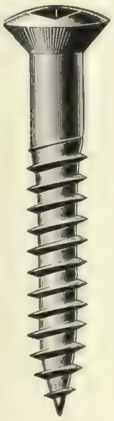
ROBERTSON SOCKET HEAD

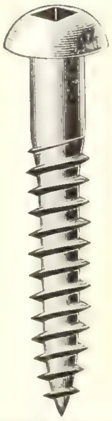
Wood Screws



See That Square Hole

Pat. Feb. 2, 1909





THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO

Keiths LIMITED

Reduce Insurance Premiums

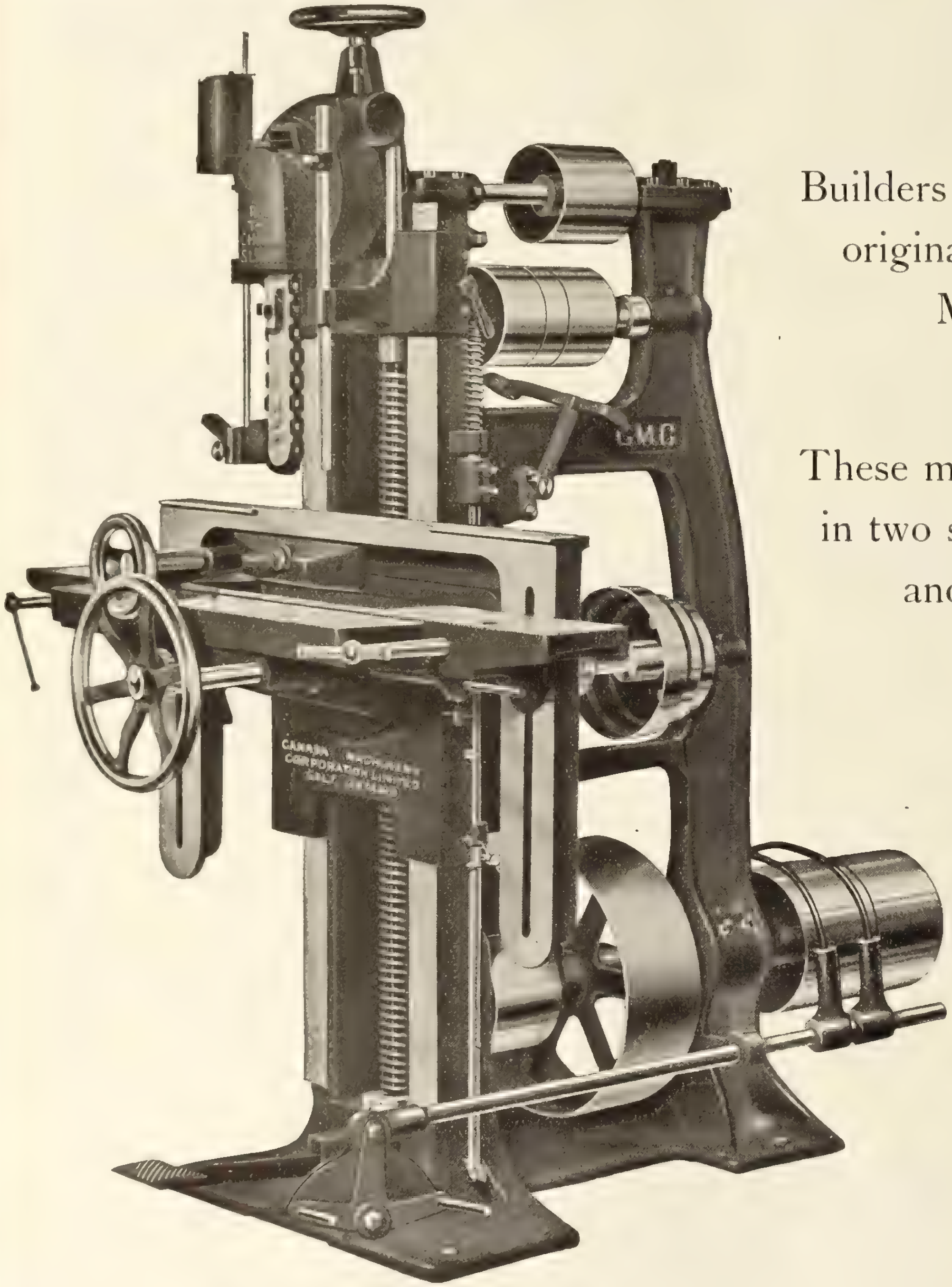
WILL YOU LET US SEND YOU AN EXPERT FREE OF CHARGE

to show you the best investment you ever made. Many Sprinkler Systems are paying their Owners 50% per annum return on the investment in reduced insurance premiums, and in addition are affording almost perfect protection against loss by fire due to interruption of business.

Head Office, 297 Campbell Ave., Toronto
Quebec Office, 707 New Birks Bldg., Montreal
Agents—Frick Co., Waynesboro, U.S.A.

Associated Automatic Fire Sprinkler

Chain Saw **C.M.C.** **Mortiser**


C.M.C
CANADA MACHINERY CORPORATION LIMITED GALT ONTARIO

No. 541 CHAIN SAW MORTISER

Builders in Canada of the
original Chain Saw
Mortisers.

∴

These machines are built
in two sizes—No. 551
and No. 541.

*Our Bulletins, fully
describing these
machines, sent
on request*

∴

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Largest Builders of Woodworking Machinery in Canada

Canadian Woodworker

**A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring, woodenware, furniture, pianos, boxes, and general mill products.**
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited
**Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.**
Nicholls Building, Toronto
Phone Ade. 929

Vol. 14 **May, 1914** **No. 5**

Extending the Use of Walnut

THE question of developing a field for the more extensive, and at the same time more profitable, use of walnut is occupying the attention of manufacturers in the woodworking trade. Present indications tend to confirm the belief that a section of the trade which is drawing quite extensively on this wood for its raw material, and a section which has probably realized its possibilities in this direction to a greater extent than in any other line, is the piano trade. That this class of manufacture is developing with increasing force year after year is a recgnized fact, and in the interest of the market for walnut it is satisfactory to find that in this line of manufacture the quantity of walnut at present in use is steadily increasing. This is true more particularly in parts of the United States, notably the middle-west, the reason probably being the fact that eastern piano manufacturers are more conservative in their methods and consequently more diffident in adopting changes in styles of raw materials. Considering the excellence of walnut it is surprising that the wood is not utilized in larger quantities for fixtures and piano work. The explanation of this is forthcoming from a walnut dealer who makes the observation that one of the chief reasons is the apparent widespread mistaken idea regarding the quantity of this stock available and the price for which it can be purchased. Furniture and piano factories, he asserts, frequently send out enquiries for walnut stocks and instead of troubling themselves with looking up firms who specialize in manufacturing this line of lumber or veneers, they communicate with manufacturers of other hardwoods inviting quotations in connection with their usual line of manufacture. The consequence is that these firms, who probably are without any supplies of walnut and have no means of getting it other than through walnut specialists, write back quoting the prices of some other walnut dealer's stock, which prices are apt to range at five to ten dollars above what it could be purchased for direct. Under these circumstances it is not surprising that the piano and furniture men get an erroneous idea of stocks available and the prevailing values. The result is obvious. They are consequently discouraged when it comes to using any of this class of material. In broadening the market for walnut it is necessary to disseminate accurate information on these two points. For a long time to come there will be sufficient walnut to supply any reasonable demand and it is a well-known fact that this stock can be had at prices which conform to prices for other high-class cabinet goods. It is therefore the duty of the walnut man to give the proper publicity to his stocks and to remove the mistaken idea which appears to have taken hold of those who would become possible purchasers. It is also the duty of the walnut specialist to educate the furniture and piano manufacturer to the possibilities which lie in walnut, which possibilities can be developed considerably by proper finishing methods.

The Influence of Modern Office Furniture

Attention is called by a writer in Office Appliances to the influence of modern office furniture upon business men, and the difference which is found in office equipments to-day as compared with that which was encountered ten years ago. Everywhere there is evidence of the intention on the part of business men to make their offices more comfortable and efficient; in fact, efficiency is the key-note of modern business, for it has come to be realized with increased force that efficiency spells service, and that service is the only basis upon which permanent business can be built. Whatever promotes comfort to employees and managers; whatever makes for better bodily and mental conditions; whatever is uplifting, inspiring, encouraging—all these things make for better work, help in the creation of a better product and enable the force to do a given amount of work more quickly with fewer loose ends and less delay. The first physical expression of this idea is in the offices of business men. The idea is not merely to provide furnishings which shall be pleasing to the eye, but while introducing factors of beauty and comfort to insist upon convenience and practical efficiency in providing desks, files, typewriter cabinets, card cabinets, etc., which shall answer all the requirements of the office with regard to capacity and accurate system. Office men, nevertheless, insist that these things shall be accomplished without violation of the principles of design and color harmony. All these things tend to the quiet, efficient accomplishment of good work, just as the engine with the smoothest bearings gives out the most power with the least resistance.

A chair which will cost, when completed, about four hundred dollars, is to be built for the San Francisco-Panama Fair by Mr. Levis S. Chasey of the Monmouth Rustic Manufacturing Company, Red Bank, N.J. Five years ago Mr. Chasey began planning to build the chair. He has communicated with every governor in the forty-eight states asking that official to forward a piece of wood cut which his own hands, from the state of which he is governor, this wood to be used in the manufacture of the chair which will probably be the only one of its kind in existence. Part of the back of the chair will be made from a piece of white oak. The chair itself will stand five feet high and will weigh nearly forty pounds. In joining the parts, square gold plated lag screws will be used. On each piece of wood the name of the governor, the state and date on which the wood was cut will appear on a small silver plate. The chair is expected to take between nine and ten months to build.

Proportioning and Laying Out Doors

Specially contributed by a Staff Correspondent of The Canadian Woodworker

DOORS, although made in an endless variety of designs and sizes, are, after all, very simple in design and construction, the main feature, apart from the artistic phase, being the proper proportions of the different parts and the joining together which enables them to withstand the hard usage to which they are subjected and the unequal strain imposed by the mounting. Fig. 1 shows a plain four panelled door which may be taken as representative of all doors, no matter what their specific design may be.

Of course, the plainest way in which to lay out a door is to make a detailed drawing of it, but in practice, giving instructions to men who need know only the style and dimensions, it is customary to furnish the information in the simplest possible way, giving only the features which modify the general make up from some standard. Thus, some lay off the distances on a line whose length is the total height of the door, the marks on the left side, Fig. 2, denoting the vertical dimensions consisting of the widths of rails and their positions, with the sizes of tennons, etc., while on the other side are laid off the widths, the extremes being the widths of the styles, outside and inside the grooves, and exactly halfway, the widths of the muntin, outside and at the bottom of the grooves to receive the panels.

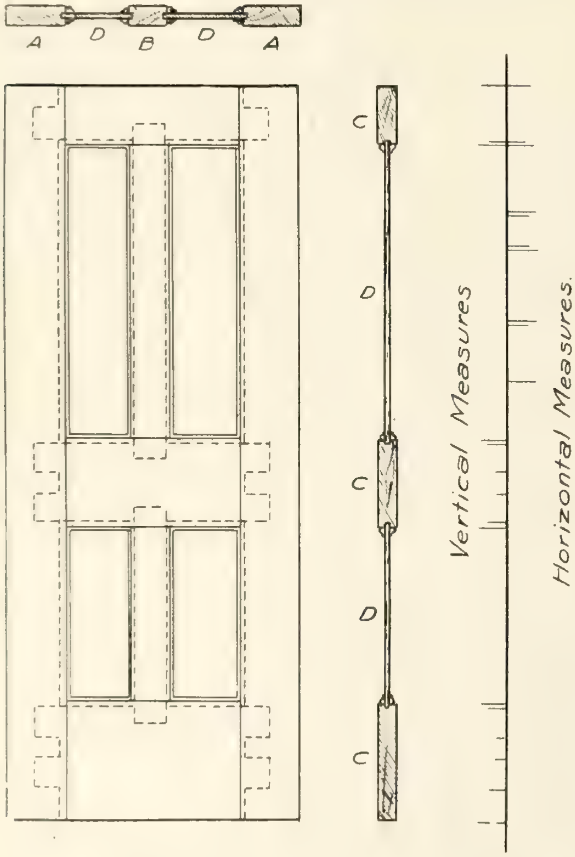


Fig. 1 Fig. 2

Proportioning and laying out doors.

All grooves are generally ½-in. deep and tennons are usually about 2½-in. wide and 1½-in. apart, with 1½-in. or more between the outside of tennons of the rails and the edge of the door. The tennons are always made with a short projection called a Relish (C in Fig. 3), which fills the groove in the style to make the door more solid. Styles and rails are made from 4-in. wide x 1¼-in. thick in light doors to any sizes and thickness desired, preserving the same general proportions as shown in Fig. 1.

The elevations, Fig. 1, show the styles (a), and the muntin (b), also the rails (c), and the panels (d). Fig. 3 shows the details of the grooves in style and rail (b) and (e) and mortice (a) and tennon (b) while the relish is clearly shown at (c). Fig. 6 shows the detail of the panel resting in its groove and the molding finish (H) secured in place by finish nails.

This is the construction followed in the better class of doors and does not show the ends of the tennons, while in some cases with the cheaper doors the mortice extends clear through and sometimes poor workmanship is assisted by wedges as shown in Fig. 4, driven into place with glue and subsequently cut off flush in the final operation of trimming.

Most of the so-called hard wood doors or those showing natural wood graining and finish are veneered, and in laying out such doors, the thickness of the veneer must be allowed for.

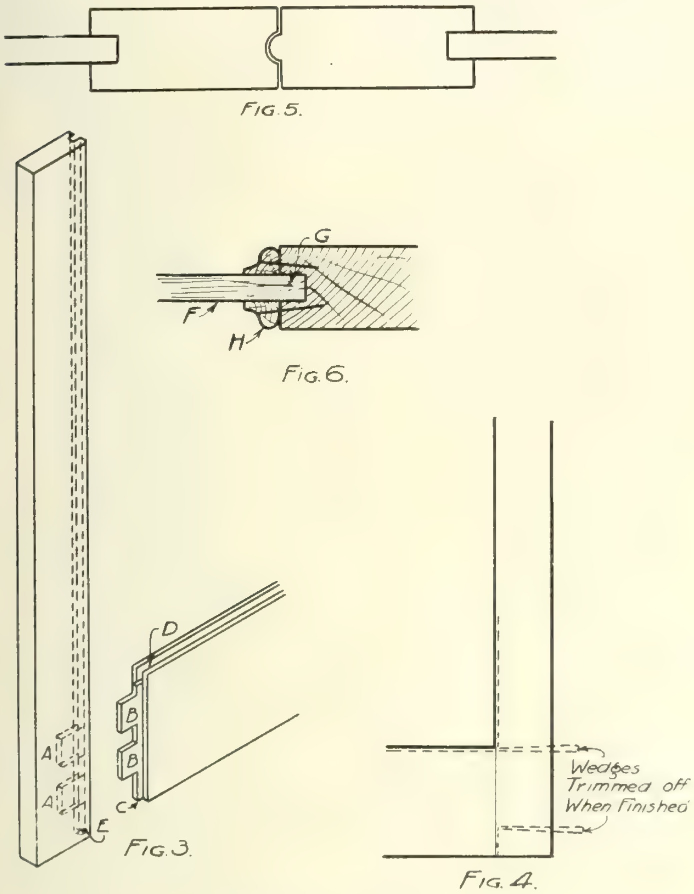
In swinging doors, all the strain comes on one of the styles and extra care must be taken to secure the proper fit of the joints to prevent sagging, whereas in a sliding door the strain is vertical and lighter construction except in the top rail is permissible.

Sliding doors usually have a shallow tongue and groove at the inside edges, so as to preserve alignment when shut, Fig. 5, and be tight after the slight shrinkage which is inevitable.

Folding doors follow the same rules, but must be built heavy enough to support the extra weight or the second or third fold, and the inside edges must be rounded off so that the doors will fit together easily, the proper curve being found by striking a radius from the edge of the door to the joint.

In actual practice in the factory, the different parts of the doors of various sizes are all of a standard, the sizes and proportions depending upon the experience and custom of the manufacturers and the demand, that is, the groove for the panels is always the same, as is the thickness of the tennon and depth of mortice. So also with the raising of panels and the various shapes and designs of moldings used for trimming, so that what actual laying out is necessary is confined to the designation of the positions of the various joints.

Where a number of doors of the same size are to be made the laying out of one piece only for each operation is necessary, the machine being set by the sample piece and the balance being duplicates. As a rule, however, the location of each mortice and tenon, which affects directly the fit and strength of the door is either marked directly on the piece by a marking machine, or the fits are located by very carefully set gauges.



Proportioning and laying out doors.

It may be of interest to those who are given to whitewashing the interior of a factory each summer, for the sake of cleanliness and light, to know that one authority advises that an improved or a durable whitewash can be made by slacking white lime with hot water in a covered vessel. Then, if some tallow is added to the boiling lime, it will make a whitewash that will wear like paint. There are two general kinds of lime on the market, one that is high in calcium corbonates and another that is high in magnesian carbonates. It is said that magnesian lime is best for whitewashing purposes.

The lumbermen of Northwestern Canada will hold a four-day convention next September in Winnipeg. A general invitation has been extended to lumbermen in the United States, and the event promises to be notable in the history of the industry. Particulars may be obtained from Mr. J. Hooper, chairman lumbermen's publicity committee, 322 Donald street, Winnipeg.

Standard Factory Conditions

ONE very important thing in the successful management of a woodworking factory is the standardization of sizes, patterns, grades and dryness of stock; the standardization of conditions under which work is done, and of what amount of work shall be a standard for a given time; the standardization of tools, appliances, jigs, machines and methods, as well as the route the material is to follow, and definite instructions describing how the various parts of the work shall be done. To do this intelligently and with the least effort, standard records must be made, including written orders covering complete copies of all items sold—factory construction orders cost records, written instructions fully describing the operations required, what machines they are to be performed on, their sequence and duration, as well as direction.

This may seem to many readers voluminous and far-fetched, but the secret of good management is in this exactness of standards and their being carefully followed as described. To do good work and do it correctly and in the least time, there must be just the right ideal as to the article to be made and the tools to make it with. This involves, further, the right material, supplied in the right amount, at the right time; correct knives, well tempered and sharpened and of the right pattern, supplied to the workmen without loss of time or unnecessary shutdown of machines, all belting in good working order, of proper tightness and pliability; material in the most convenient place for in-feeding; trucks to facilitate its prompt removal when completed; machine properly speeded for cutterheads and feed rolls to do the best work.

These conditions can only be found in their ideal operation where the organization of the working force is well thought out and provision made for carrying on the work in the easiest way. To do this simply, orders should be dispatched by the foreman in charge of the department in which they are to be filled. Requisitions for material should be made on the stockkeeper or yardman, and should state size, kind and grade of lumber, time wanted and at which machine. The tool room must be held responsible for sharp knives, correct in pattern and temper. The repairman should see that machines are in repair, the belting in good order and kept so. The machine foreman must instruct the operator how to run his machine, as regards speed of feed. He must know that the machine is properly speeded; that the feed rolls feed in positively and without injury to stock. He must provide the operator with all necessary appliances, jigs, patterns, etc., needed to do the work well and quickly. The workman should have his work planned for him, his instructions carefully and explicitly written by the foreman, and no work should be done without the foreman's order.

Cost records should be so kept that the capacity of each machine on each kind of work is a known quantity. This knowledge should be applied in planning the day's work and dispatching same, and if it is carefully done, each man will know what constitutes his day's work. These records should also be the basis of payment for work done. If some inducement is offered for exceeding the ordinary daily output it will be an added impetus to an enlarged day's work. This is equivalent to reduced cost of production.

Like conditions and requirements should apply to all departments, each under a capable head. The foreman of each department should be encouraged by the superintendent and management by hearty co-operation and support. All standardized work or operations should be set down and written, so that every man will know what is required of him, how far his responsibilty reaches and where it ends.

To maintain standards requires proper inspection of work done. Inspectors should be entirely separate from the departments and amenable only to the superintendent. No work should be shipped unless it has been passed by the proper inspector. One of the objects of the management is to keep the quality up; another is to prevent mistakes. These are best accomplished by frequent examination of work as being done, and assistance rendered the workmen when difficult work is to be turned out. With right ideals, under proper conditions, and due incentive for each man to do his best, the management should be able to do good work promptly, with satisfaction to the trade and credit to the concern.—H. T. Gates in The Wood-Worker.

Short Cuts for the Furniture Factory

THE further manufacturers and consumers of dimension stock go with the proposition, the more numerous do its advantages become. The general, basic arguments in favor of using lumber cut to size have long been familiar to the trade; but the detailed benefits appear only with actual trial of the proposition.

Experience is beginning to accumulate, and the results are the more impressive by reason of the improvements brought about, from every angle. In a word, dimension stock has not only made good, but it has made good in more ways than it had been expected to do, and the latter features furnish a strong argument in favor of the more general use of the plan.

For example, it was pointed out not long ago that consumers are insisting more than ever before on carrying small stocks, and on getting just enough lumber to insure a sufficient supply at all times. The dimension stock plan fits into this mode of operation as though designed for it, and the experience of a number of furniture factories in this connection is enlightening.

When ordinary lumber is purchased, it is necessary to kiln-dry it, of course, before putting it through the factory. It is next to impossible to arrange receipts of lumber on so exact a schedule to keep the kiln filled, and to insure an ample supply of dry lumber constantly being available. The result is that whether the consumer wants to or not, he is compelled to carry a surplus of considerable extent, and the rehandling of this lumber, from the car to the yard and from the yard to the kiln, is an added expense which an ideal operation of the system would get away from.

This is accomplished by means of the dimension system. The manufacturer of lumber cut to size kiln-dries his lumber before cutting it up, and as a matter of course keeps a considerable quantity of dry stock on hand. When he gets an order for dimension lumber, all that is necessary is to cut the stock to size and ship. Thus the consumer is nearer to his supply of material by the length of time required to dry under ordinary conditions, and is consequently that much better off when it comes to planning his purchases and arranging his manufacturing operations.

In fact, experience has shown that the plan of having a steady supply of lumber move from the manufacturer to the factory consumer can be handled more conveniently when dimension lumber is used than when ordinary stock is shipped. If the plan of the consumer has been to carry a considerable stock of lumber, and have enough kiln-dried stock on hand to keep the machine-room supplied at all times, the use of the facilities of the lumberman enables him to reduce his investment in stock and to have shipments made against his actual requirements and not against his future needs.

In this connection another advantage has been discovered. The manufacturer who heretofore has carried a considerable amount of lumber in his yard, in order to have plenty of stock ready for the kiln, or who has had a good deal of money tied up in dry stock, awaiting the needs of the cutting department, is now able to take the same money, put it into dimension stock, and be ready to surface the material and send it to the cabinet-room at a moment's notice.

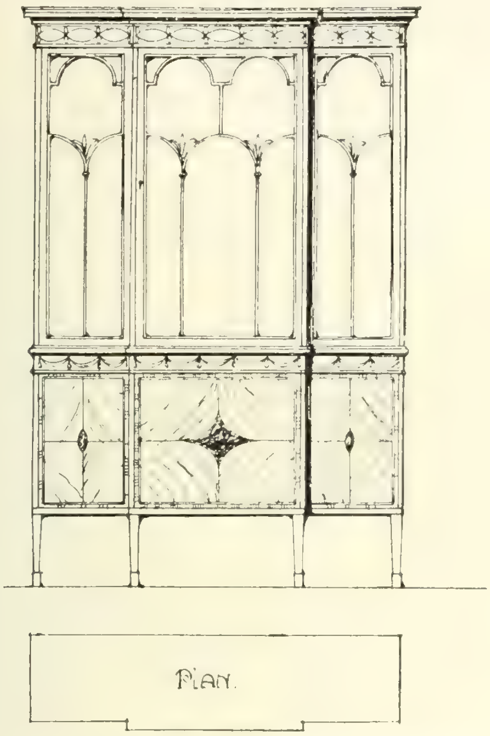
In other words, the furniture manufacturer has heretofore been "up against it" on the matter of deliveries, in a good many cases, because of the difficulty of getting out special lots in less than sixty days. In fact, many furniture men assert that it is impossible to do justice to the work and put a piece of furniture through, from the kiln to the car door, in less than two months.

The peculiar trade conditions in this business emphasizes the disadvantage of not being able to ship quickly. Usually the retailer does not order until the last minute, and when he wants a piece of furniture or a carload of it, he usually wants it in a hurry to take care of demand which is developing at that time. Delay in getting the goods to him is frequently fatal, and interferes with the success of the manufacturer. But since he is not in a position to anticipate the demand, except in the case of staples which can be depended upon, he is compelled to wait for orders, and then must rush in order to get them out in time for use by the retailer.

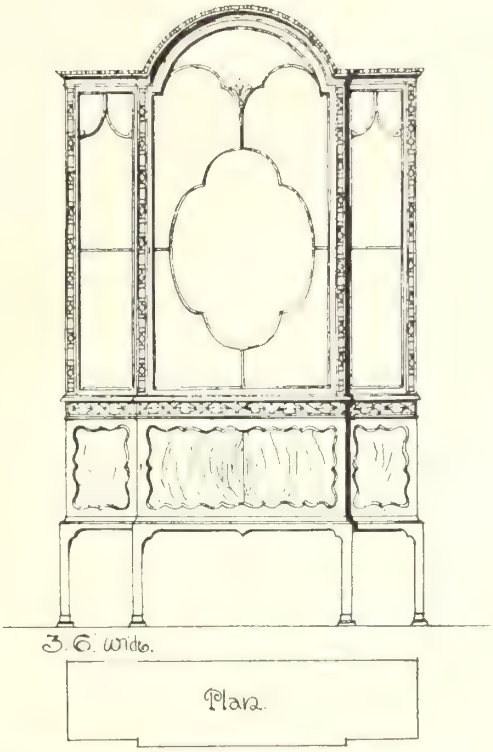
That makes the big advantage of being several important steps in advance of the usual procedure all the more desirable. If instead of putting the lumber through the kiln and then having it cut to size in his own machine-room, he can take the dimension lumber from stock, where it was carried for just such an emergency, he can save from three to four weeks in getting out the goods. And that much time is often the difference between holding a customer by good service and losing him because of slow deliveries.

The flour miller seldom carries the finished goods in stock. The chief reason is that flour values are much greater than wheat, and interest, insurance and other carrying charges mount up too high to make it profitable or practicable to have a very large supply of flour ahead. But the miller does carry wheat in stock—all he can afford to buy when the market is right. He wants to have his material where he can get it at short notice, and in such shape that he will not be de-

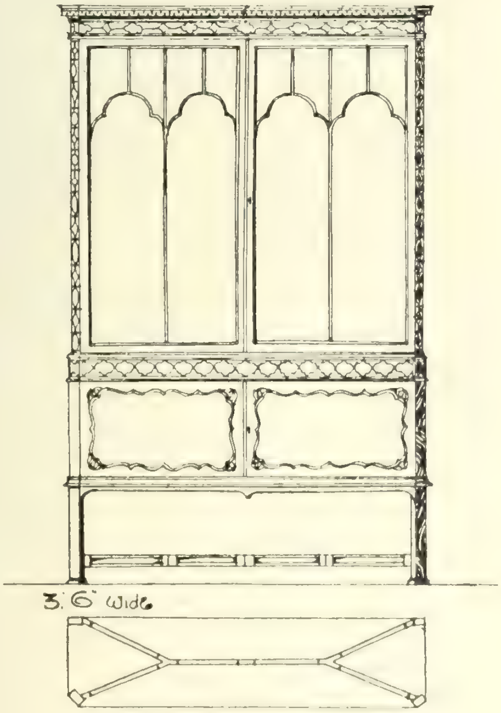
(Concluded on page 20)



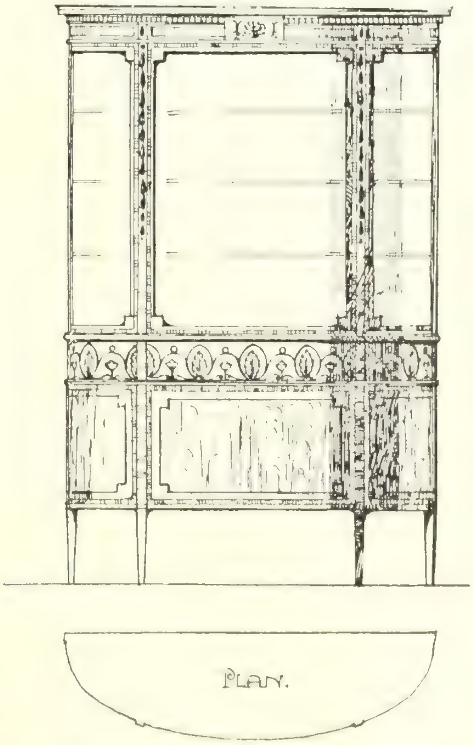
A 4-ft. inlaid Sheraton cabinet, in mahogany, inlaid stringing in frieze. Lower portion—flush fronted panels, with band and quartered veneer and inlaid swag in lower frieze.



Suggestion for a Chippendale china cabinet, in mahogany, dull polished. Carved cornice, fret pilasters and figure wood panels.



Suggestion for Chippendale china cabinet, in mahogany, dull polished, corners on angle, stretcher cut through.



Adam cabinet, satinwood inlaid dental in cornice and husk on posts to be inlaid. Inlaid string in lower frieze and flush fronted panels and door in lower part.

Original Designs for Cabinets

(Short Cuts for the Furniture Factory)

layed in beginning the important work of converting grain into flour.

The furniture manufacturers have learned that they can play the same sort of game in connection with dimension stock. Instead of manufacturing their furniture complete, and carrying it in stock, a procedure which is difficult and dangerous, from the standpoint of policy, because of the absence of exact knowledge on the subject of demand, they work up their raw material as far as possible, under the restrictions necessarily imposed, and are thus ready, at any time the demand for a given item develops, to begin its manufacture at a point much further along than would ordinarily be the case. Even in the case of numbers which are doubtful sellers, standard parts can be provided, so that only the odd items need to be made up when the order comes in.

"We make a wide and constantly changing range of styles," said a furniture man not long ago, "but we have found it to be a considerable advantage to put in a big stock of standard parts, such as legs, tops, etc. We order these for practically the entire season's requirements, as we see them, and then specify deliveries from time to time in sufficient quantity to give us a big stock of this material. The process of manufacturing, when orders are received, is considerably shortened. We have much of the material, even on the numbers regarding the demand for which we are not certain, already made up, and the work of getting it out is therefore greatly expedited. This, we believe, is one of the greatest advantages of using dimension stock, from the standpoint of the consumer."

A point which dimension men have been quick to take note of is that the cost of handling a great number of small pieces is much larger than the expense involved in taking care of the same footage of lumber of standard lengths. Consequently, in order to meet this objection, furniture material is now shipped in bundles, secured with wire, so that a car can be unloaded quickly and economically.

In the same connection it is worth noting that the dimension men are performing a service not unlike that of the veneer manufacturers, some of whom match and tape veneers so that they are ready to lay when received at the factory. That is, in many cases the dimension manufacturer matches up lumber that is to be joined, rips it to size and keeps the various pieces together in the bundle, so that each top is a unit, and the consumer is assured of having uniformity as to color and figure. This is a real service to the factory man, who ordinarily makes many blunders in setting out solid tops through being unable to secure uniformity in these respects.

These and many other practical advantages, which are developed only by actual operation of the system, have served to win many permanent customers for dimension stock manufacturers, and to increase the business of those mills which provide the right kind of service regarding such things as matching up and inspection.—Hardwood Record.

Japan is now introducing two new woods in Germany, specially adapted for ply wood and known as tamo, a substitute for oak, but much cheaper, more easily worked, and of a very suitable color for the German taste, and sen, a substitute for ash. This wood has been placed upon the market and advertised widely from Hamburg.

A New Method of Gearing Motor Drive Direct to Single and Double Surface Planers

THE specialization to which the construction of modern woodworking machinery has been subjected in order to obtain results commensurate with the ever-increasing competition, heavy administration and selling expense, has tended more than anything else to concentrate the attention of woodworking manufacturers upon the various factors that influence the cost of production. It is recognized that it is of vital importance to maintain all driven machinery at the maximum speed consistent with good work, and that no method of driving machines shows more saving or possesses the advantages of direct motor drive. This method permits the location of machines so that they may allow direct routing of material in sequence of operation so as to avoid rehandling and its attendant expense, damage and congestion. It banishes the line shaft and countershaft, consequently there is no friction power loss from this source which can safely be assumed to be under good conditions of lubrication and alignment. Direct motor drive clears away all overhead hamper, allowing more light, more air, more overhead room; it also allows more floor space, every inch of which in a factory is valuable.

Machines so driven can be operated overtime, or any time, without interference with other equipment of machines, machinery or other departments. It has a direct bearing upon wear and tear on the other machines, as it makes it possible to accelerate the load from rest to full-speed without shock, or to cut off power from the full load instantly, which allows quick stoppage of the machine involved, in case of injury or accident, without interference with the operation of other machines in the plant. "Safety first" would not be so prominently before us had it not been found that accident is coincident with high industrial efficiency partly directly and partly indirectly by its reaction on the operators in their work. Safety guards, gear cases, etc., are important and necessary, but just as much so is the capacity to instantly shut off power from a machine, some portion of which may break and entangle the workman.

Direct motor drive cuts out belting, and, therefore, belt cost, which is a very substantial saving; for under average conditions it has been found that the yearly upkeep of belting amounts to nearly forty per cent. of the original cost. In many woodworking plants, belts wear out in from five to twenty months and on some woodworking machines, such as single and double surface planers, the belts travel at about a mile a minute, and are frequently subjected to sudden starting strains that reach many times beyond the limit of elasticity. It is obvious that in order to drive a single and double surface planer by attaching the motor to the cylinder of the planer, it is requisite that the rotations of the motor be as fast as the revolutions that the cylinder should make. Under low frequency 25-cycle alternating current the fastest motor obtainable would only rotate 1,500 times per minute, which is inadequate for direct connection to cylinders that must have a working speed of 3,500 r.p.m. To meet this condition, and to make use of the lower frequencies of current, Messrs. Baxter D. Whitney & Son now apply to their planers a very compact geared type of motor drive that by change of gears only will accommodate any motor speed from 1,100 to 2,000 r.p.m., and increase these revolutions to the desired number necessary to operate the planer cylinder. The movement is transmitted through a flexible coupling which is a very good feature, as, while permitting perfect alignment of the gear drive arrangement with the cylinder shaft, it is flexible enough to offer no hindrance to the operation of the planer or power transmission should there be a slight mis-alignment which, however, ought not to occur because of the simple way of adjusting the alignment.

This method if drive deserves commendation as being of special benefit to the woodworking manufacturer located where low frequency current prevails. It is a factor that, if utilized, will result in more and better planing, and a decided lowering of upkeep and power costs.

Essentials of European Practice in Kiln-Drying Plants

WOOD seasoning and drying plants are built in the form of: First, drying kilns or chambers, into which the lumber is placed and left for several days, after which it is removed and new lumber placed into the kiln. Second, kilns in which the chambers are of a moderate height, wide and very long. There are rails in the chambers on which cars with the lumber are run in and out. Within short intervals of time a car with kiln-dried lumber is run out on one side of the plant, while a new car with unseasoned lumber is run in on the other side. Such kilns work continuously. The hot air is either forced through the lumber by means of blowers, compressors or suction apparatus.

Both types of plants permit operation with regular change of air if ventilators and fans are used to reverse the air current. The outgoing air saturated with water vapor is drawn off by the fan, passed through drying chambers and then again conveyed to the kilns. Air passes through the chambers in the direction of the longitudinal axis of the canals in such a way that the cooled air comes in contact with the dried lumber which has just entered the kiln. Equipment works either with forced draft in the shape of fans or with natural chimney draft. Heating coils, piping, or furnaces, depending on the heating system used, are placed either along the ceiling of the kiln chambers or on the side between the different chambers. Fresh air is taken out of the boilerhouse or else direct from the open air. Waste air escapes into the open air or else is blown into the shops for heating purposes.

For equipment with heating systems we must consider the following heat losses for the heating-up periods: 1. Warming or initial drying of lumber; 2. Heating of air blown into the kiln chambers; 3. Evaporation of moisture in the lumber; 4. Heat transmission losses through walls and losses of heat when changing loads and cars of lumber.

Speaking of the kiln-drying of various timbers we have to consider the most common types of material, designating them in classes as: (a) Oak or ash, air-seasoned; (b) beech or oak, green; (c) fir and pine; (d) mahogany, walnut and hickory.

(a) Oak can stand quite high temperatures, initial temperatures from 140 to 149 degrees F., with a final temperature of 104 degrees F. The air currents and the velocity of air should be moderate as the moisture leaves oak only very slowly, and the waste air rarely passes from the kiln completely saturated. Preliminary steaming of the oak is not here deemed necessary. The waste heat might be used to heat a kiln filled with pine, provided the two kilns are in direct communication, so that there is no excessive heat loss in transmission. Oak which has been recently cut is treated like beech.

(b) Beech (green). If in drying beech we begin at once with a normal air velocity, the sap would leave the lumber too quickly and would condense on the surface. The lumber would dry at those points, become as hard as glass, and the sap being imprisoned beneath this hard, glossy surface, cannot escape. With continued drying under the influence of higher temperatures, the wood pores contract, and the volume shrinks. At the same time, the volume of the inclosed sap increases, and we have in the interior of the timber a tension which is very high, and which finally tears the fibers apart and splits the lumber.

The truth of this assertion is proved by the fact that even thick boards often are torn apart and split with a terrific roar, the results being similar to those obtained with an explosive. Another proof is the following experiment: Take an oak board somewhat wormeaten, but still strong, and dry it in contact with red-hot iron plates. The surface pores close up in a short time. A jet of steam will sometimes be seen to be blown through one of the wormeaten holes, showing there are internal stresses and tensions.

In order to bring the sap in the beech to the surface, it is steamed before drying, until even the innermost heart of the wood is heated and saturated by the steam. The temperature for drying can be between 131 and 140 degrees F. If the drying kiln is long enough, the final temperature may be as low as 77 degrees. In this way the air is completely saturated with moisture quite a number of feet away from the end of the kiln. We have therefore a precipitation of water vapor which is given off by the supersaturated air. This moisture has a beneficient influence on the beech, especially if the same be of small dimensions.

The circulation of air and air velocity should be greater than that used for oak, since more water is given off by the beech per unit length of kiln than is the case with the oak.

(c) Fir and Pine. These two kinds of timber can be dried with a temperature of 113 and 122 degrees F. The final temperature should be 77 degrees, as the precipitation of moisture is to open the pores of the lumber. If this system cannot be used, the air-reversal system should be employed. The hot air will then be circulated again and again by the fan until it is entirely saturated, which process is followed by a precipitation of water vapor which takes the place of the wood steaming.

The motion of air is very fast, as the timber of the pine and fir variety give off moisture very rapidly, and as much air is required to absorb the water vapor.

(d) Mahogany, Walnut, Hickory. These are usually air-seasoned before they are kiln-dried. The initial temperature is about 104 degrees and the air moves with a moderate velocity. The final temperature is 86 degrees F.

As was seen, the temperatures depend on the type of lumber seasoned and the length of the kilns. It should be noted, however, that the drying process should begin with a comparatively low temperature and with very moist air. If the lumber gives off much moisture in a short time, the initial temperature can be high and the kiln chambers short.

If in the same kiln, however, air-seasoned timber were to be dried with the same temperature and the same air velocity, the temperature would be found to be too high for the beginning of the drying process. The percentage of moisture in the air is too low to open the wood pores and the wood would be split and open. In this case, the air-reversal method should be used or else steam conveyed to the last third section of the kiln. Only saturated steam should be used both for steaming and for bending of lumber.

Every drying kiln should have a sufficient number of measuring instruments—among them at least three thermometers and three hygrometers placed at the two ends of the kiln, where moisture precipitations are to occur, and at the center of each kiln.

Peep-holes should be covered with at least three thicknesses of window glass so as to avoid losses of heat.

Water manometers control the air movement, showing pressure in mm. water column, as also the quantity of air conveyed into the kiln. The initial temperature and humidity of the air are read off at each end of the kiln.

If the readings in the middle show only slight differences, and at the end, however, there are high humidity and low temperature, it is a sign that the moisture content of the last few loads of lumber charged was too high. Consequently a few carloads of lumber can be removed from the outlet end until thermometer and hygrometer in the center of the kiln show readings about half way between the two end readings.

If on the other hand the thermometer readings are right but the hygrometer readings show too much moisture, the kiln works with too slight a quantity of air or else the air contains too much moisture or water vapor. If the temperatures are in the proper relations in all three readings, but too low, a few more heating units must be added.

Usually the chambers have one or more heating pipes parallel with the floor running at floor level, and these convey more heat to the lumber and also create a sufficient circulation of air. As the saturated air is heavy and remains at floor level, it often happens that the lumber in the same car is dry in the upper and middle layers and too moist and green in the lower layers. All this is avoided with the use of the pipes along the floor levels.

The lumber dried in kilns may tend to become very dark, due to high temperature. There is always the danger of splitting if the air is too dry. The use of the thermometers and hygrometers is thus an absolute necessity for proper operation of the kilns. These kiln chambers are built for a certain quantity of lumber, containing a definite percentage of moisture. Neither the moisture percentage nor the quantity of lumber can always be kept the same, and the operation of the kiln must therefore be regulated bv means of admission of fresh air or steam, change of air velocity and other means to allow for the changed conditions.

As regards the quantity of lumber, care should be used to have the right number of cars always loaded to the proper limits. In no case should there be an insufficient amount of lumber either in length, height, or breadth of the cars, as then the air would tend to follow the path of least resistance around the loaded cars instead of through the lumber in them.

A worse fault is committed in running a new car with fresh lumber into the kiln immediately after withdrawing a car of dried lumber at the opposite end. The entire drying process is disturbed through such a proceeding. The green lumber dries too quickly, and splits and opens.

In order to prevent ends of boards from cracking, cross laths should be placed flush with the cross ends of the boards. The air can only attack the ends of the boards, and not the faces. Boards cut near the heart of the tree have the tendency to warp, dry unevenly and dry hollow.

The soft sections between the annular rings shrink more than the hard annular rings. As boards are never cut exactly parallel to the heart, and as trees never grow exactly straight, the annular rings of the same tree will have different positions in the boards, especially if these have a considerable length. As the boards dry in a definite ratio, depending on the distance from the heart, they do not dry evenly, and will be found to be crooked at the end of the drying process and require considerable planing when truing the boards.

Another cause of trouble, but with the same result, may be the uneven passing of hot air over the boards. If one side of the boards is exposed to a greater quantity of hot air than the other, the former will dry more, shrink more, and the board will be uneven due to the poor drying. Sometimes the cause is poor piling of boards, the layers being separated by sort of air cushions.

For cross laths several short sizes should be used rather than one length running all the way across. Boards cracked on the ends should be clamped together before drying or else nailed together with the aid of laths. Short pieces of lumber as those used for parquet floors and barrel staves are piled up diagonally, with the stacking laths parallel to the length of the kiln.

Wood used for furniture should have about 6 to 10 per cent. moisture after kiln-drying and that used for interior woodwork from 8 to 10 per cent. A good kiln should dry a certain quantity of lumber containing a given percentage of moisture, in a given time, without undue shrinkage, cracking, or splitting, leaving a definite percentage of moisture in the lumber.

In a woodworking establishment, for example, it has been found that it costs fifty cents a thousand feet to pick up lumber and put it down again. Hence every time an operation of picking up and putting down lumber is eliminated by introducing an extra truck, fifty cents (less depreciation and interest charge on the truck) is saved on every thousand feet of lumber processed. If it is easier to use a truck than not to, as it usually is in the average shop, the manager will find that apparently an unlimited number of trucks are absorbed before a surplus of empties is visible.

For some years boat oars of Australian mountain ash have been shipped to England, where they came in competition with American ash. The timber was cut in New South Wales. It was recently learned that an imitation had been put on the market. It looks like ash, but is in every way inferior to it, and is said to be a species of eucalyptus. The government of New South Wales has taken steps to prevent the palming off of the inferior wood for the ash.

Patching a Double Pin Socket on a Woodworking Machine

When overhauling a heavy woodworking machine, the writer recently found an idler frame broken in two places, as shown by Fig. 1. A and B show where the breaks occurred and as it was not convenient to send the casting to the foundry to serve as a pattern for a new one it was decided to patch the old casting and make it answer. It may be stated that on both the cylinders shown were pins running the entire length of each cylinder, which were 8 inches, the idler being fitted upon one end by one pin and a taper friction upon the other end of each pin. By giving this idler frame a twisting sideways movement, one or the other of the taper frictions was brought into action.

It was decided to forge two bands and to shrink them upon the idler frame, one band to be placed directly outside the rib B while the other band was placed over the remaining rib. Each band was made of soft steel one inch wide and 5-16 inch thick. A length was carefully measured with a wheel and the bands cut off and welded up. Then they were fitted and shrunk on as shown by Fig. 2.

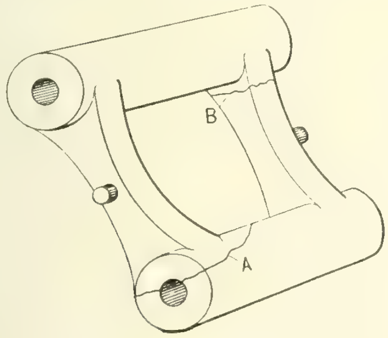


Fig. 1 Broken idler frame on a woodworking machine.

One of the cracks marked A in this drawing corresponds to the same crack shown in Fig. 1. The other crack B is not visible, being behind a portion of the idler. It was found after shrinking the band and after an attempt to close down the parts C and D upon the connecting web that the bands did not stay tight. Every time C or D was tapped with a hammer to force it close to the casting it would seem to stretch and to allow crack A to loosen up. The writer soon found the cause of the trouble. It was the old principle that "a crooked brace has little strength."

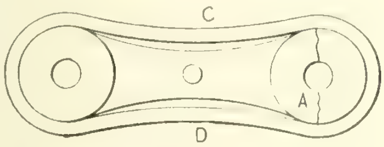


Fig. 2. A shrunk-on band that proved weak.

If anybody desires to test out how much stronger a straight brace is than a curved one, just let him place a short piece of ¼-inch iron between the jaws of a vise and then screw up the vise up on the metal. As long as the piece of metal remains perfectly straight great force must be applied to the vise handle, but just as soon as the piece of metal cripples sideways then much less resistance is offered. The metal becomes a crooked brace, so to speak, and shows that it possesses far less strength than when it was straight.

This caused the trouble at C and D, Fig. 2, and to remove this defect a hole was drilled through either side of the band and then small cap-screws were inserted as shown at E and F, Fig. 3. By tightening these cap-screws the band was drawn closer to the casting and the uttermost pressure was exerted upon the metal adjacent to crack A—so much pressure, in fact, that the crack was quickly closed and almost disappeared from sight.

The writer has since used this method of tightening bands and finds it one of the best yet devised. Even upon a straight surface a band may be tightened by tapping in a cap-screw as shown at E and F, then placing a small piece of metal a short distance on either side of the screw E proceeding to screw home the cap-screw which carries the band with it, the short crosswise pieces of metal forming the piers of a suspension bridge so to speak, and the portion of band between the pieces of metal being the span of the would-be bridge. Then by screwing down upon cap-screw E the band may be tightened even to the point of breaking should the pieces of steel be made of considerable thickness.—Wood Craft.

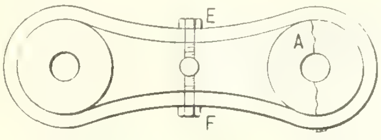


Fig. 3. Strengthening a steel band on broken idler frame.

In the construction of factory and mill buildings the common practice is that of installing "skeleton stairs." In the interests of the "Safety First" movement this is a practice which should be discouraged, writes W. F. H. in The Factory. These skeleton stairs are built with treads only and without risers. The open spaces between the steps make it only too easy for someone coming up the stairs to accidentally drop something and kick it through the open space to fall on the head of whoever happens to be coming up from below. Another bad feature of this type of stairs is that it is impossible to sweep them down without the dust and dirt falling through on those below. While this feature may not be considered particularly unsafe, yet it is unsafe in that it is unsanitary, besides being a nuisance. In one factory a start has been made towards remedying this by nailing a vertical board or riser below the first step on each floor and at each landing. It is the intention to complete the work and make tight stairs all the way.

About 5,500,000 staves are used in the Mediterranean district each year in the manufacture of barrels for currants and figs. The staves which are imported from European countries, are made from a variety of beech wood which is very strong and tough. They come ready for use in size 31½ ins. long, 3¾ to 4 ins. wide and ⅜ in. thick and are seldom fashioned by the local coopers who manufacture barrels in a rough way. Staves range in price from $19.30 to $21 per thousand c.i.f. city of destination.

Over sixty million feet of lumber has been used so far in constructing the general buildings of the Panama-Pacific International Exposition. An additional ten million feet will be required to complete the structures. It is computed that forty million feet will be needed by the States, foreign governments and concessions in the erection of buildings and equipment.

Points Worth Considering in the Selection of Belts and Pulleys

Contributed by W. F. Schaphorst

IT is a common failing for nearly every mechanic to think that he knows as much as need be known about belts. Perhaps this is due to the simplicity of belt contrivances. A strip of leather running around a pair of plain pulleys does not appear a bit complex. "We don't care anything about the technicalities. All we want is something that will make the wheels go 'round and keep them a-going." That is the philosophy of many of the belt users in saw mills, woodworking shops and in a great many machine shops and power plants that are otherwise very well managed.

Let us begin at the beginning and say why we think there is so little to know about belts. I am the owner, let us say, of a woodworking plant. I want to install a band resaw in my plant. I send for literature to various advertisers of such machinery. These catalogs usually contain plenty of good pictures and complete descriptions of the machines themselves—the weight of the machine, size of band saw wheels, rates of feed, sizes of pulleys, height, and space requirements. But, the width of belt necessary to drive the machine, the kind of belt, the thickness of the belt and the horse-power required to drive the machine are all omitted, yet every item omitted is important.

Transmission Feature Neglected

Many purchasers will go ahead and buy the machine without considering the transmission end of it. The writer has done so himself in installing similar machines. Transmission is frequently considered so unimportant that it is given no thought at all. As soon as the machine arrives the "boss" looks at the pulley, "estimates" that a 6-inch belt will do the trick (the width of the pulley is 8½ inches) and sends an apprentice boy for a length of belt that the boss roughly stepped off. "Forty-eight feet" he tells the lad "will be a-plenty." The boy goes to Jones' hardware store where he knows the firm runs an account, and informs a salesman that his boss wants 48 ft. of 6-inch "belt." Without asking a single question the salesman selects a roll of leather belting that he "thinks" the boy wants. The boy totes the belt to the shop.

After giving the belt a cursory glance the boss immediately orders one of his poorest mechanics to "belt 'er up." The mechanic obeys and with the aid of the apprentice boy determines the length of the belt by the common cut-and-try method. His first trial proves that in his judgment the belt would be a little too slack, so he takes off three inches more. It looks a little better to him but he decides it is not quite enough yet. After a third cutting he concludes that enough has been cut off but finds the belt ends aren't exactly square, which necessitates a little more trimming. By the time he has finished and has laced the ends together according to a lacing method of his own which he invents on the spot, the belt is as tight as the proverbial drum string. He announces the completion of his "job" to the boss who hastens over, "judges" the tightness of the belt with his hand and "surmises" that the belt is "a little too tight." "But," he adds, "it will soon stretch." "All new belts," he agrees with the mechanic, "should be made very tight."

They oil the machine, turn on the power, and give the machine an initial trial. The belt is forgotten and will in all probability never be thought of again until it causes a hot box, runs off, or slips so much that it screeches.

Such is the method that is followed in a large majority of cases where small machines are involved, especially where the driving pulley comes with the machine. The selection of the belt is a combined guess and accident. And curiously enough, in nearly every case the belt does the work. This is undoubtedly because designers of pulleys are students of psychology. They know that it is best to give a pulley ample width.

The selection of a belt should be given more serious consideration. The manufacturers of the machine should recommend a proper width, thickness, and make of belt, and they should also give the power requirements of the machine. Not infrequently the installation of a new machine under conditions similar to the above necessitates the addition of more motive power or the shutting down of other machinery during the operation of the new one in order that the latter may be run at proper speed. The transmission problem should be solved before the new machine is installed.

Information Furnished by Manufacturers

Manufacturers of large power-consuming machinery now-a-days make it a practice to employ engineers or skilled mechanics as salesmen both in the field and in the office. These salesmen can usually be depended on to give reliable information. They know from experience that it pays to be truthful in making claims for their wares. It is their business to make the transaction an economical and satisfactory one for the purchaser as well as a profitable one for the manufacturer. Should failure occur even in the belting the purchaser is liable to blame the manufacturer, especially if the latter has given advice concerning the belt. The seller finds it poor business to be "blamed" for anything, hence endeavors to answer all queries correctly.

The average belt user does not like to bother with the theory of belts and pulleys, and the writer sympathizes with him. The mathematics involved in the theory of belts is too cumbersome. It is much easier and usually better to put the problem up to the manufacturers who are well acquainted with its peculiarities and who can back their recommendations with precedent. Should an inexperienced man attempt to solve a belt problem he would probably distrust his own figures anyway. Even the scientist who has devoted much time to belts is sometimes reluctant to make a definite statement. For example, at a meeting of the American Society of Mechanical Engineers several years ago, at which a lengthy paper on belts was read by Mr. Barth, this question was asked by a member who participated in the discussion: "I would like to ask Mr. Barth or any engineer present whether he would use the same size belt with the 6-inch pulley as the driver, as with it as a driven, and with the same size of pulley, and whether in this case it would last longer, other conditions being equal." It sounds simple, but to the writer's knowledge that question has not yet been satisfactorily answered and perhaps it never will be. Although the mathematics of belts is so well known that a mathematician can "compute" closely the sizes needed, there might be some practical hindrance to the adoption of the mathematician's results. Experience and judgment must be well mixed with the mathematics.

Belt Formulas vs. Experience

The fundamental belt formula upon which calculations are based in determining the size of belts and pulleys is, to most belt users, a most complicated and technical affair. Briefly, it takes into consideration the tension on the tight and loose sides of the pulley, the angle subtended by the belt in contact on the small pulley and the coefficient of friction of the particular belt under consideration. With each of these factors determined a good mathematician has the facts upon which to find out how wide a belt or pulley he requires. But how many mill men are able to solve such a problem? Take a four foot pulley for instance, delivering 30 h.p. to a 2-foot pulley, with the centres 25 feet apart and the driving pulley making 300 r.p.m. The writer has gone through the very tedious "scientific" solution of this problem for the width of the pulley, with a belt having a coefficient of friction of 0.25. Anyone who works it out successfully will find that the belt should be between 8 in. and 9 in. wide, with a working tension of 300 pounds per square inch and a belt 0.20 in. thick. Each inch of such a belt would carry a force of 300 lbs. x 0.20 or 60 lbs.

The writer uses this complex method only when in doubt about other methods although he has a wholesome respect for the much quoted Mr. Rankine who first derived it, as well as for the scientists who still use it.

Many bewildering belt formulas have been developed, but, correct as these may be, their very appearance discourages most men, and, when they are used the designer frequently enlarges the result anyway, should he "judge" the belt unsafe. Why not use a good, reliable, tried and true rule-of-thumb in the first place? Here is one as given by Chas. A. Schieren, Jr.:

"A good transmission rule, and one that leaves sufficient reserve power in the belt, is to divide the number of feet that the belt travels per minute by 800; the result is the number of horse-power that a 1-inch single belt will transmit; in other words, if a belt travels 2400 feet per minute, according to this rule a 1-inch single belt under this condition would transmit three horse-power, a 10-inch belt 30 horse-power, and so on.

"A good rule for double belts is to divide the number of feet that the belt runs per minute by 500; the result is the number of horse-power that a 1-inch double belt will transmit. In other words, a double belt 1-inch wide running 2500 feet per minute will transmit 5 horse-power, and wider belts in direct proportion.

"These are both old rules and they are safe."

Applying this rule to the problem that we have just discussed we find that each inch of width of the belt will transmit

$$3770 \div 800 = 4.71 \text{ horse-power}$$

The belt must therefore be $30 \div 4.71 = 6.5$ ins. wide.

To be on the side of safety we will decide on an 8-inch belt inasmuch as our previous method resulted in approximately that dimension. Knowing that the above rule is much used, and is generally reliable, the writer would recommend an 8-inch belt in an indoor woodworking plant, a 10-inch belt in an out-of-doors saw mill or other plant where dampness and dust are unavoidable. Where surroundings are unusually wet or greasy or where there is great danger of slipping, a 12 or even a 14-inch belt might be used.

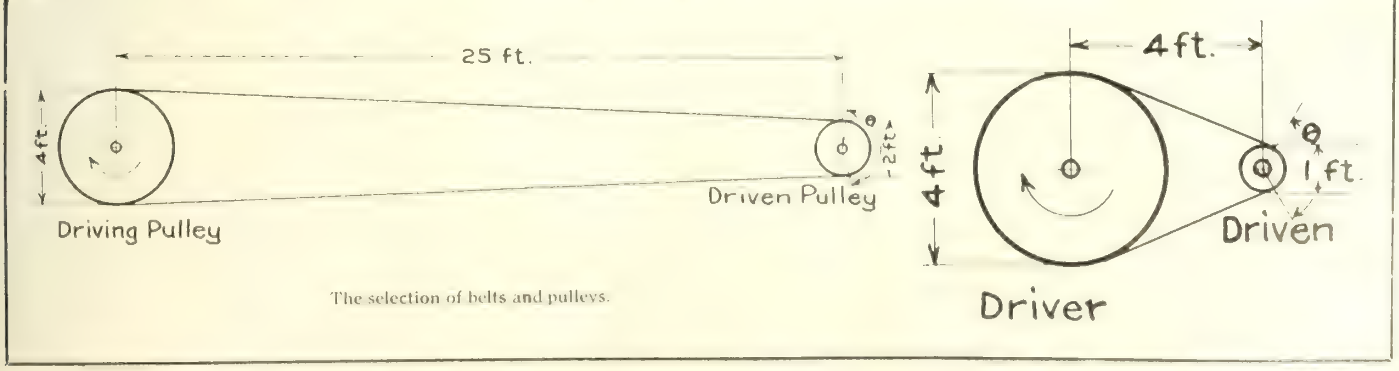
A drive to which the rule-of- thumb does not apply satisfactorily is shown below.

Here we have a large pulley transmitting power to a small pulley (all other conditions are the same as before), on very short centers. The contact arc on the small pulley is small. Still, application of the "rule" will not increase the width of belt although we know that greater tension is necessary in order to create greater friction, or, the arc of contact on the smaller pulley must be increased either by treating and slacking the belt or by the use of an idler. Without recourse to either of these methods the first formula given tells us that a 9.7 inch belt will be needed.

It is therefore evident that judgment plays an important part in the determination of belt sizes. In using the Rankine formula we judge the coefficient of friction. After we apply the simple rule of thumb we again use our judgment, thereby arriving at about the same that would be obtained through a more elaborate process.

The Right Size of Pulleys

To determine the size of pulley needed for any machine the r.p.m. of that pulley and the r.p.m. of the driving pulley must be known. A circular saw, for example, is rigidly connected with the driven pulley to a common shaft. The saw must make 1,000 r.p.m. The line shaft from which power is to be belted makes 400 r.p.m. 1000 divided by 400 = 2.5. The driving pulley must therefore be 2.5 times as large as the driven pulley. A 6-in. driven pulley and a 15-in. driving pulley would then have the correct ratio. Now, whether they are the correct sizes or not depends upon the horse-power to be transmitted. Small pulleys are satisfactory where belts are thin and pliable and where



The selection of belts and pulleys.

little energy is to be transmitted, but they are not so satisfactory where considerable energy is to be carried. To be sure that pulley sizes are correct the manufacturer, as stated before, should be consulted or a similar installation should be inspected. The manufacturer, of course, will base his recommendations on results of experience.

Because of the varying coefficient of friction for different materials, it is obvious that pulleys made of different materials will pull varying loads.

Application of the above belt rule, however, tells us that we need an 8-inch belt. We know that a pulley should be as wide as or wider than the belt. Pulleys 9 inches in width will therefore suffice and we will select the one that in our "judgment" best combines dependability, economy, and handiness.

It is now obvious that on account of the inter-relation of belts and pulleys we cannot decide one before we have considered the other. Before the type and width of pulley can be chosen for any machine we must compute or obtain from tables and curves the width and thickness of belt desired. On the other hand the width and thickness of belt cannot be correctly fixed until the diameters of the pulleys are known. The larger the diameter of the pulleys for a given power, the smaller the cross-sectional area of the belt.

The Scroll-Band as a Re-saw

Contributed by Leonard A. Blake

A great cause of kicks both from the saw and from the sawyer is the indiscriminate use of a well-tuned scroll band-saw as a re-saw. One saw may cut a curve to a line in 6-inch lumber but will play all kinds of tricks rather than go straight through the middle of a piece of, say, 1-in. x 6-in., guided by a gauge. The true reason, of course, is that neither saw nor machine were ever intended for re-sawing purposes, but it is a reason that is not always strong enough to prevent this practice.

If it is really necessary to make use of the band saw for such a purpose, much of the damage to the saw may be eliminated by arranging things a little differently than for a true re-sawing machine.

The use of a gauge is the basis of most of the difficulty as a rule. A filer, in putting up a re-saw, fits and tensions it to run in a straight line parallel with the line of the feed. A scroll band does not receive such particular attention, so long as it does not show a tendency to wabble from side to side, the sawyer can follow his lines all right, even if the saw leads a little out of parallel with the center line of the machine. But if a straight gauge were to be used with the saw in such condition the saw would just run out at the side of the board.

To overcome this difficulty the straight gauge is replaced by a square ended block as shown in sketch, Fig. 1. This serves to keep the stock upright and at an even distance from the saw, as does the gauge, but unlike the latter it allows the board to be swung a little sideways to track with the lead of the saw blade. Needless almost to say, the wider the saw the better for deep cutting in straight lines, because it is possible to strain it tighter, which makes straight cutting easier. Even, however, with these preliminary precautions a scroll saw is likely to go astray in a springy board. Such boards should be run over the rip-saw so as to make a deep groove from both edges in the line of the intended cut. This relieves much of the tension in the wood and also forms a line of least resistance for the saw to travel in.

Such makeshift methods as these, however, should not be employed where there may be a truck-load of small stuff sometimes to split down for panels, etc. A wide saw should be kept for the work and tensioned to run with a straight gauge, and the teeth should be sharpened specially for re-saw work.

There is just one other thing that may, perhaps, be mentioned here, and that concerns the cutting of circular pieces without the use of a pattern and pencil to mark out the stuff before cutting. By setting a small center point in a board and clamping the latter across

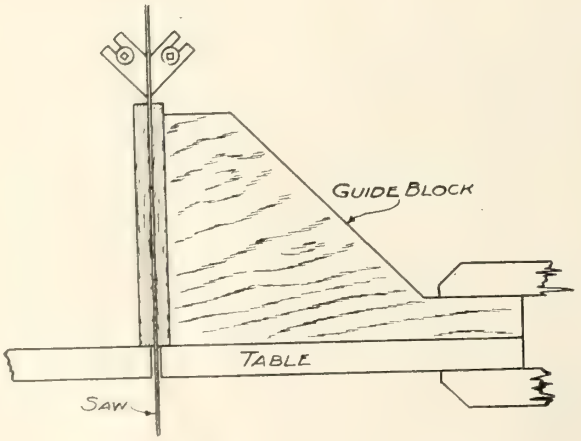


Fig. 1—Guide block for resawing

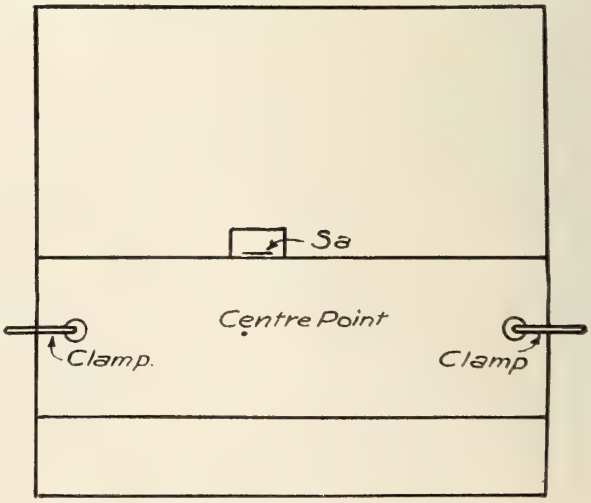


Fig. 2—Set-up for sawing circles.

the table so that the point is in a position corresponding with that of the center of a circle being cut, a piece of wood may be centered on the point and turned around and cut to a true circle more certainly than by a line, especially where the operator is not a man of long experience. Should the saw show a tendency to run out, the base board should be tapped to bring the center point a little forward towards the tooth edge of the saw. If the saw runs in, move the point a little in the opposite direction.

Fig. 2 gives an outline of the second "short cut." But even with all these makeshifts the fact remains that a scroll saw is a scroll saw and cannot be made into a resaw without calling in a machinist. If the machinist has to be called in from outside the plant it would probably be cheaper to order a re-saw in the first place, for machinists are not so very far removed from those notorious workmen, the plumbers. This statement is made from actual experience.

Care of Saws in Furniture Factory

By O. C. Oberberk

SCROLL saws ¼-in. in width, teeth spaced ¼-in. apart and 2-gage in thickness, will give good results in average work, while for heavy work, such as sawing swell or sweep drawer fronts, a saw ¾-in. wide, 19-gage thickness and ½-in. spacing, will give good results. As the ¼-in. saws wear narrower, they may be used for sawing carvings, etc., while saws broken beyond repair may be cut into short lengths and used for jig saws.

In setting these saws I use an automatic set, after which the ¼-in. saws are filed by hand. Give just as little set as is required to make the bends and set oftener, as I think the saw chattering in cut, caused by too much set, tends to crystallize the saw, which, in turn, may cause the cracking of blade.

When filing a scroll band in an automatic filer which uses the regular 6-in. slim taper file, see that the edges of the file are straight, that the machine is kept clean and well oiled, and that there is no play in slide rods or bearings. I firmly believe that if the filing machine is kept in good order it will give as good results as hand filing, and more of it. Set the feed-finger to bear on second tooth to be filed, as this tends to keep teeth of a more even length. A few drops of lard oil put on the file once in a while will make it last longer and cut smoother.

In brazing the saws ¼-in. wide I use the blow-torch method, filing the laps ¼-in. long and using silver solder, as I think it gives a much stronger braze than spelter or brass wire. Clean the solder with a little pure muriatic acid, place it between laps, after which sprinkle with powdered borax and dampen with water. Start the torch, applying a slow flame at first, after which bring it up to a good heat or until the solder flows freely; then clamp quickly with a pair of flat-nose tongs. This tends to force all surplus solder out of the braze, making a strong joint. Care must be used in applying the tongs, as the braze will kink easily while hot. This method of brazing with torch and tongs may leave the joint in a hardened condition, so take an oilstone or piece of emery cloth, brighten the saw, and with the torch draw the steel to a blue color, when it will be about the same temper as the rest of the saw. If care was used in filing the laps and if saw is placed straight in clamps, you will have a straight saw and a braze which will last as long as the rest of the saw. In dressing down the braze, use a saw gauge to determine thickness. In brazing scroll saw ½-in. or wider, I use the regular brazing clamps which I use for the resaws, using silver solder and "Brazine" for a flux.

The proper size of resaw to use, as to spacing of teeth, gauge, etc., may be hard to determine when mixed woods are to be sawed. I would recommend the following spacings: For a 20-gauge saw, teeth spaced 1⅜-in. apart, 5/16-in. deep; for a 19-gauge saw, teeth spaced 1½-in. apart, ⅜-in. deep; for an 18-gauge saw, teeth spaced 1⅝-in. apart, with hook line of 2½-in. in 6-in.

In levelling saw do not let swaged points rest on the leveling block, as it will tend to show plate slightly dished. Level the teeth as well as the rest of the plate and keep tension as even as you can, using care to see there are not tight places near the edges. Run the tension from edge to edge, using no tire in saw. Put in just enough tension that saw will lie flat on leveling block, and put a little crown in back of saw, say from 1/64-in. to 1/32-in. in 5-ft.

I swage out the points six gauges wider than the saw, then with the swage-shaper bring it back to five gauges of swage; in other words, a 20-gauge saw will have a finished width over top of tooth of 15-gauge; a 19-gauge will be 14-gauge, etc. Before swaging I put a small quantity of lard oil on each tooth. Generally the swage-shaper will bring all teeth back in line, although it is good practice to go over the teeth with a set-gauge.

In brazing a resaw, make a lap of ⅜-in. for a 20-gauge saw, 7/16-in. lap for 19 and 18-gauge saws, taking care in filing to keep them free from oil, and never touching lap with the fingers, although "Brazine" will clean the laps of oil; still it is a good plan to keep the fingers off some things.

Several years ago I tried to braze a broken piece of cast iron, but it wouldn't stick, and as I had trouble with my brazing irons sticking to the saw, I decided to have a pair of cast iron ones made. Now, after using them for several years, I would use no other. Cast iron never scales in heating, does not stick to the braze, and as the irons are planed to size, there is no poor braze resulting from irons of uneven thickness. These irons are 1¼-in. wide, 9/16-in. thick, 18-in. long, surfaced two sides. Cast iron is brittle when hot, and if you drop it on the floor it will break, but I have given them all the pressure the brazing clamps were capable of and they would not crumble.

When the saw is placed in the clamps ready for brazing, heat irons to an orange color, slip quickly into clamp, and apply pressure. When irons turn from dark-red to black, remove them, pour machine oil over braze, and you will have plenty of temper left in braze. Dress up the braze the same thickness as the rest of the plate; put crown in back, and tension the same as the rest of the saw.

In summing up I wish to say that if a saw has a poor place on it, such as a bad crack or a braze which is open in places, don't humor it; rather have it come apart in the filing room than on the mill.

It is interesting to know that cottonwood may sometimes be substituted for white holly. Another interesting fact in this connection is that in the lower Mississippi Valley country there is some native holly grown which may serve practically all the purposes of the imported article. Also tupelo gum offers some service in this connection.

The Value and Importance of Filing Lumber Carefully

After nature has done her part in growing good timber, and the sawyer has attended properly to his duties and has cut lumber of even thickness and with few defects, there yet remains an important work which cannot be slighted without doing damage which may offset the efforts of both the sawyer and nature. The lumber should be well piled when it is put on the sticks to season. That is a step which must be attended to with care. It is as important as the sawing.

The majority of millmen do not need advice or suggestions along that line; but some do not give the matter as much consideration as they should. They seem to proceed on the theory that the principal purpose in piling lumber is to give it a chance to season. That is one of the objects in view, but lumber should season straight and flat. Kinks, twists, and warps will spoil lumber which otherwise would be perfect, and unfortunately much is spoiled in that way. Complaints from manufacturers who use lumber and dealers who buy and sell are too widespread to leave doubt that there is considerable ground for the charge that too much lumber is spoiled in the piling. It is put up in such a way that it seasons crooked when if it had been better piled it would have dried straight. This applies more particularly to hardwood lumber, though similar causes will produce like effects with softwoods.

The foundation should be firm and true to start with. If it is lopsided, sunken in one part, or raised too high in another, the lumber will bend to fit the foundation, and will dry that way. After it has once set in that form it cannot be straightened and its value is lessened. Sometimes a foundation is true at first, but when the load is placed on it, one part, being on softer ground, sinks, and the whole pile is distorted. No matter how carefully the piling is otherwise done, the lumber will not dry true if the foundation is uneven.

Other things may happen to the injury of lumber, though nothing may be wrong with the foundation. The cross sticks may not be placed in line, one directly above another. It is important that they should be so, particularly if the piles are high. The weight on a stick out of line with the others will bend the boards, and they will season in that distorted shape. In small piles or where the lumber is to remain only a short time, the arrangement of the sticks directly above and below one another may not be so important; but even there it is desirable as a guarantee that the lumber will dry straight.

Sticks out of line are usually the result of carelessness on the part of those who do the piling. A stick is liable to be pushed a few inches out of place when the first boards of a course are laid, and the careless employee may neglect to make it right. Injury of good lumber from that cause is large in the aggregate.

There should be, of course, enough sticks used to place them sufficiently close together to prevent the boards from sagging with their own weight. They should be laid flat on an adequate number of sticks.

There is another cause for crooked lumber that is entirely too common. One stick may be thicker or thinner than the others laid in the same course with it. Such a stick placed midway in a course will give a hump or a sag to the course next above. If it ended with a single course, the result would not be so bad, but it does not end there. The succeeding courses assume the same hump or sag, and a single stick may make a dozen or twenty courses crooked.

Too many yards overlook the importance of having the sticks of uniform thickness. If this were carefully watched a great improvement would follow in many lumber yards. While looking after the thickness it is well to look after the width of the sticks also. Many sticks are wider than necessary. Such a stick is not only a waste of material, and a waste of labor in handling, but it is also a waste of time in seasoning the lumber. The board dries more slowly under the stick than in the open space beyond; and it is evident that every inch of space needlessly covered by a wide stick hinders the drying of the lumber by that much.

The stick, by pretty general consent, ought to be an inch thick. If thinner than that it does not provide a sufficient space between the courses of lumber for the circulation of air. The sticks should be as narrow as possible, provided always that they must be strong enough to carry the load placed on them. They must not crush under the weight of the superimposed pile of lumber nor crush into the lumber. It is claimed that if piles are of medium height, sticks one inch square will suffice.

It pays well to provide sticks of uniform thickness and width. They can be worked out rapidly on a small saw, and one man in a week should be able to true up enough sticks to equip a pretty large lumber yard. Thus all could be of the same thickness, and no lumber would bend out of shape by having thick and thin sticks in the same course. The width of the sticks is not of so much importance as the thickness, as far as keeping the boards straight is concerned; but it should be borne in mind that the use of sticks wider than necessary is not economical.

It goes without saying that the ends of boards should never protrude far beyond the last stick. If they do, they will sag and will dry in that form. If boards of the same length only are placed in the same pile there is little danger of sagging at the ends, because the sticks will be placed regularly near the ends; but sometimes courses of very large boards are mixed with short ones, and the ends are left unsupported.

Twisted and warped lumber may result from insufficient covering for the piles. The top courses in that case are exposed to weather and they warp because the upper sides are frequently wet.

Lumber may suffer injury from causes other than twisting on account of bad piling. Storms may drive rain water between the courses and it may lodge there long enough to produce warping or dishing of boards. To give a chance for drainage, the pile is usually given a pitch length wise. The rain sheds off, as far as the roof is concerned, but that which gets between the courses may be hindered by the cross sticks from draining away, and it will stand in puddles against the sticks until it evaporates.

Better drainage of storm water may be secured by giving the pile a pitch sidewise. The sticks will not then form a dam to hold the water from flowing away, but it will flow down grade along the sticks and escape, leaving the lumber free from standing water between the courses in a few minutes after the rain ceases. Better circulation of air is likewise secured by the side pitch of the pile, The spaces between the sticks will form flues, as it were, to draw the air through the pile.

The piling of lumber is an art with many details Some mills have mastered it, but others have not yet wholly succeeded. The better the piling is, the straighter and more nearly perfect the seasoned lumber will be. Everything does not depend on the piling, but a great deal does; and it is one of the details of manufacture which no millman can afford to neglect. Unfortunately some do neglect it, and the crooked lumber that is too often seen in the market is one of the results. Of course some woods are so inclined to warp and twist that it is next to impossible to prevent distortion, but there is no wood which will not be benefited by careful piling while it is undergoing the process of seasoning.—Hardwood Record.

Laying Out Knives and Setting Up Sticker

By T. Keefer

THERE are many methods of laying out knives and setting up the sticker, but the one shown herewith I have found to be the quickest and most accurate. It is only necessary to get the square of the head and make the proper projection for the lip of head or chipbreaker, and whatever the straight knives are set out, which is usually ⅛-in., and exactly from where this knife cuts a circle, make a drawing similar to the one shown in Fig. 1. This will give the exact depth that any knife will cut, no matter whether straight or irregular.

The scale should be laid out on a piece of heavy tin or galvanized iron, so you can prick the center very slightly, for if your dividers slip a little or wear 1/100-in. from center, your scale will be off considerably. If you can't get a piece of tin or galvanized iron big enough and perfectly flat, use a flat board and tack a small piece of tin in the center and work from this center. First make the drawing for the head, then the rule, then the required circles to obtain the scale. Judgment and care are necessary to make the scale accurately.

Having the scale proportionately divided, use a piece of iron, brass or any kind of metal about ⅛-in. thick, 1-in. wide and about 5-in. long, perfectly flat, straight on the edges and square on one end. From each edge (if your straight knives are set out ⅛-in.) make a line ⅛-in. exactly, or whatever distance your straight knives are set out. If on one or more heads the knives are set differently or farther out, make lines on different edges to correspond with each head, then in setting knives use the edge of scale adapted for the head on which you are working.

In laying out a knife from the detail, first ascertain the thickness and width of mold to be made and outline it in a square the same thickness and width. Wherever there is a point or curve that you wish to work to, make a horizontal line in far enough to receive the measurement of scale. If it measures ⅛-in. with your regular rule, put scale on and make a vertical line to cross this horizontal line where your scale shows ⅛-in., and so on—see Fig. 2, which is exact size. After getting all the required distances, get a blank knife and a piece of good carbon paper. Lay paper with the draft on the knife, hold it firmly and mark the required pattern on knife. Grind knife nearly to these marks and try it by laying on draft to see where it needs touching up. I most always make a copy to lay out knife by, using transparent drawing paper laid over the original draft, taking the first impression on blank from this. This does not spoil any of the lines on the original draft, which I keep for setting the knives on machine.

Now take a piece of board about 3/16-in. thick, as long as the cylinder, make a line lengthwise exactly corresponding with the straight knife cut, get the exact line of guide on this board, allow whatever your inside head cuts and make a line on board to correspond. This is for the top head. Now get the guide line on opposite side of board, and whatever your inside head cuts (which is usually ⅛-in.), place this line out toward hook end of templet board and you are ready to set up the bottom head. Place draft on templet board, with the vertical line exactly with the one on templet and the horizontal line even with the inside horizontal line, if you are using the inside head. Hook the templet on the head at inside end, place knives exactly to the lines on draft, tighten knives, and that head is ready for use.

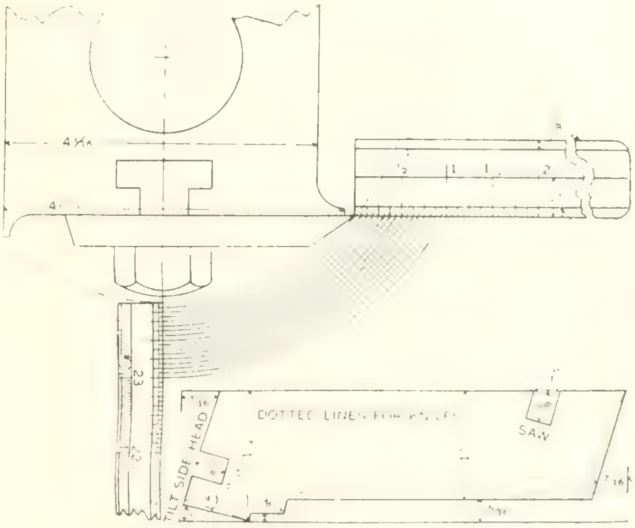


Fig. 1.

Fig. 3 shows the idea of setting the pattern on the templet board. By holding the pattern just where it belongs and placing a billhead-holder on it, you can adjust it in a few seconds. If you ever need to run any more molds like this one you can get them exactly right by saving these paper patterns and numbering them. It is also a good plan to have knives and racks numbered, and when you get set right on one paper pattern number the places on it to correspond with the knives, then when you come to run on the same pattern again you know exactly which knives are necessary. For setting up side heads, get a line on a templet board for each head, even with the bottom or bed of machine, also one to allow for the cut of bottom head. By studying your paper pattern you will easily see how to place it to get the required results—that is, where a pattern has to be molded on either side head.

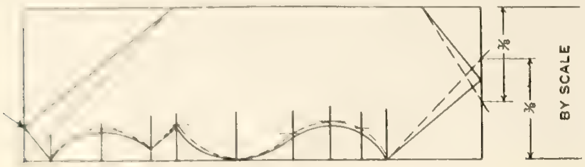


Fig. 2.

Any pattern that is the same on both sides, which can be run on top and bottom head, is made the same as any single-sided pattern except to double the paper and put a carbon paper between, thus making the top and bottom pattern at one drawing. Run the face side on bottom head on all moldings that can be run that way, as the bottom head finishes smoother than top head. For smooth work on any head keep the knives set back as far as possible. Sometimes, on lumber that is chipping, if the knives are set back to 1/16-in. from lip, it will prevent this trouble. Some operators say, try running with the cut, but this is not practical, as a trial will show. It will turn the edges of knives in and possibly draw the temper.—The Wood-Worker.

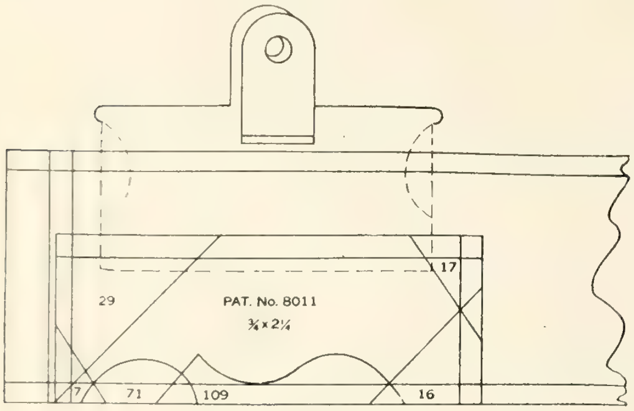


Fig. 3.

A great deal is being done by Queen Mary in reviving interest in the collecting of old and beautiful pieces of Chippendale, Queen Anne, and Jacobean furniture. Her Majesty is placing a collection of pieces, representing different periods, in various rooms in the remodelled Buckingham Palace. Old furniture, as well as other personal relics, cost more to-day than formerly now that collectors have begun to show revived interest in antique furniture. Ten years ago five dollars was considered a good price for Queen Anne chairs, now they are valued at sums nearer $250. Grandfather clocks that used to sell for $25 now bring as much as $900 for good specimens.

If you cannot sell as cheaply as your competitor, find out why before meeting his price. Don't lose money in the hope of driving him out of business, since, if you cannot bring him to consider costs, he will do all the driving necessary.

Some Points on Balancing Knives

It is rather unusual to find good knife facilities in the general run of mills, but with a knowledge of the basic idea or principles of a running balance, anyone with the ordinary experience and some little ingenuity can keep his knives in good balance, and there is no doubt about this being a vital part of the work as far as good finishing is concerned.

A planer knife is not different from a moulder knife and one would not think of putting a wide and short knife on a cylinder to balance a long and narrow knife.

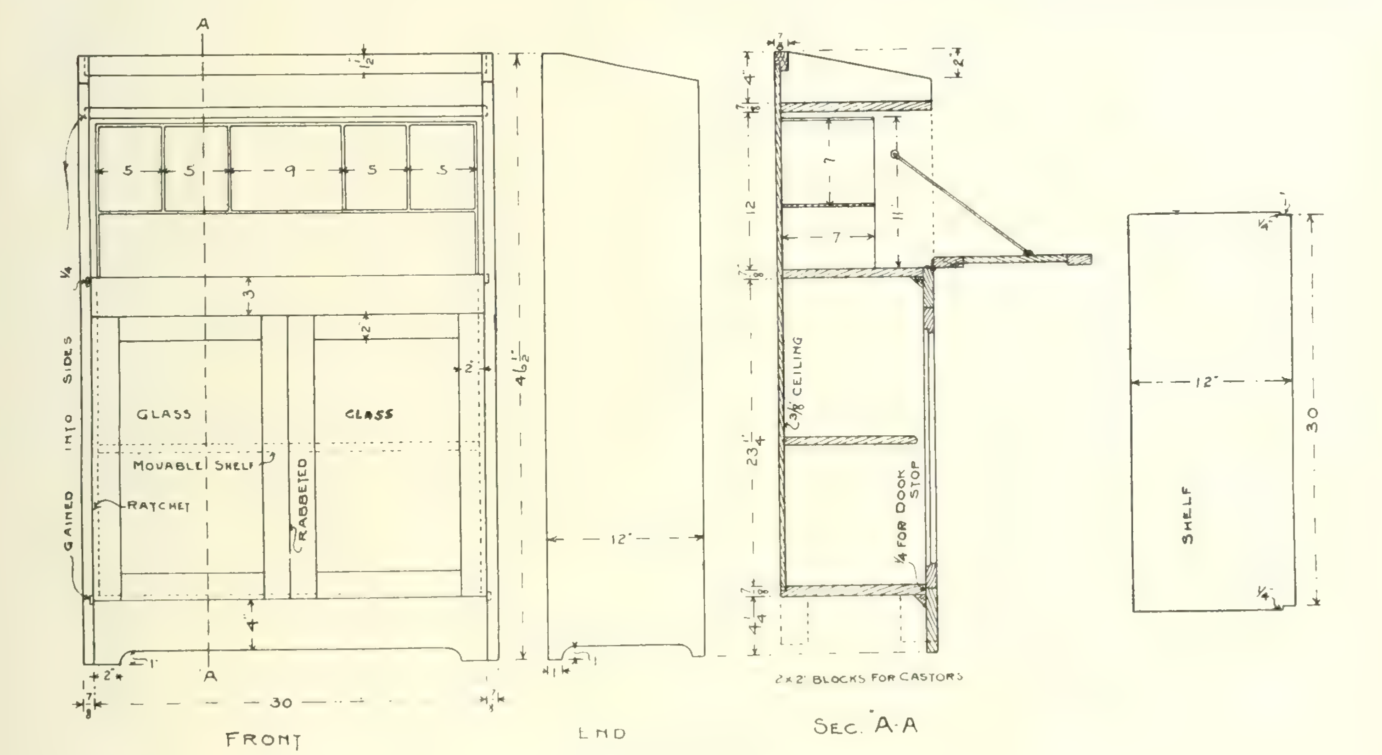
The same principle applies to a planer knife to the extent that a straight knife should be of an even width as its mate, even though it should not be of an exact width from end to end. In other words, if two knives are of an even thickness and length, though they be three inches at one end and four at the other, if both knives are so tapered in width, they will still be in a running balance, and would balance each other on a scale by dead weight, but would not balance each other if turned opposite ends on a balancing scale. Of course any variation in width as extreme as this would be unusual, but it illustrates the principle of a running balance. Knives used on wide planers on which a good deal of narrow stock is run to one side of the machine are often found to vary as much as an eighth of an inch in width which is something any grinder can prevent. The writer grinds his knives on a common grindstone without any frame or fitting other than a seat holder, but the knives are kept an exact width from end to end (but the bevels vary, being longer at the ends than in the center, but on the same principle as a molder knife this does not offset the balance). If both knives are of an exact width and thickness and length, any variation from an exact width will not offset the balance if it is alike in both knives. There are times when I have to grind narrow slots on the back of the knife, near the cutting edge rather than to drill holes in the back near the heel. It does not affect the strength of the knife and being the farthest point of the travel, the centrifugal strain is greater and requires less to be ground off than if the grinding is done nearer the center of travel. But there is little or no reason for getting knives in this condition, and when it has been done, if it will be borne in mind that both knives should be exactly alike in shape, there is little difficulty in keeping them in a running balance, though they would not be in a standing balance in all positions.

In view of the interest that has been aroused amongst furniture manufacturers from the prospective increased use of American or black walnut, the question has been raised as to the extent of the production of this wood. Commenting on its supposed scarcity which is alleged to be the only reason why the wood has not been used generally of late years, a leading producer stated recently that the estimated annual production of walnut in America is fifty million board feet. When it is remembered that walnut veneers are produced in large quantities it will be agreed that this production is sufficient to keep a lot of factories going. The German and British factories which have been using walnut for many years have never found any scarcity of the wood; they have found in it an exceptionally good material, and in this respect have shown American manufacturers that in dropping it they made a mistake. It is strange that black walnut which has been so much appreciated in other countries should receive such scant recognition by furniture manufacturers on the American Continent.

How to Make a Combination Writing Desk and Book Case

GET the material cut to size in the mill and remove all mill marks. First, take two sides and taper off one edge, as shown on plan, and cut grooves on the inside to receive shelves. Also dado the back of them to receive the ceiling, or whatever material is bought for the back. Ceiling is preferred, as it makes a better looking back. Bottom should be sawed out next, or this can be done in the mill before material is taken home.

The shelves and middle and bottom rails should next be fixed up. These should be 30½ inches long to within one inch of the front, so the groove will not show on the sides. They should be made of 12-inch material and the back dressed down so it will fit closely to the back. The top of lower shelf should be gained out to receive the back of desk, as it is not necessary for back to extend to the bottom of desk. Middle rail should be blind doweled to middle shelf and the desk is then ready to put in the clamps. Put glue in the grooves and as the material is all one inch stuff, it will probably be better to secure it with barbed nails, puttying the nail holes after the desk has been stained.



Detail of Writing Desk.

The top strip should now be gained out to receive the back; also gained out on ends to fit in between the two ends. Put it in place and cut the ceiling to size. Lay out the center of desk and put the back in place, working both ways from the center so the material will trim up the same on both ends. Ratchets and brackets should next be made for the movable shelf, and put in, and movable shelf fitted.

Next, make pigeon holes out of thin material. After they have been put in place, secure them with small nails or brads from the back and make the desk front. This should be flush on the inside to form a good writing surface. Then make the two lower doors, rabbeting them out one-half inch to make a closed joint. The glass can be procured at any glass or furniture store and should be put in with the bead on the inside. In making the doors, make them a little larger than the opening, so they can be fitted nicely. Put in the four castor blocks in the bottom and fasten them with long screws and glue. Desk is now ready to be finished. See that all glue and other marks are removed before staining.

How to Finish

As this is a plain Mission style desk, a plain, dull finish will look better than a rubbed finish. Stain the desk to suit, making the stain a little lighter for the inside. After it has been stained, putty all the nail holes with colored putty and give it two coats of wax, rubbing between coats.

If the desk is made of oak and it is desired to have a fumed finish, put it in an air-tight receptacle and see that the doors and front are open to allow the fumes to circulate. Place a saucer of ammonia in the receptacle and seal up all joints. If it is desired to watch the process, a hole may be cut in the box and a piece of glass inserted. When it has colored to the desired shade, remove the desk and putty the nail holes with putty colored to match, and give the desk two coats of good wax and rub well. This process, although a little difficult, will give better results and will not raise the grain of the wood.

Saws in the Box Factory

THE average buyer of saws which are used in the manufacture of boxes, does not realize, perhaps, the trials and tribulations which a good saw is expected to endure. I believe it is the rule in most factories for the filer, foreman or some other official to make requisition for such saws as are needed and frequently to go so far as to specify the brand of saws that he desires. The order is then made up accordingly, without particular thought on the part of the one who is to pay the bill, as to whether the saws are in every way best adapted to his use. If some such policy as this is not pursued, then it is likely that the buyer buys on a basis of price, or perhaps on the personality of a certain salesman with but very little thought as to what stunts this sensitive, high-strung thorough is going to have to perform.

How many of you have given serious thought to the requirements of a really fine saw? Take, for instance, the small 18-in. circular saw which is usually bought on a basis of price because it is considered a simple tool, and one which is comparatively easy to manufacture and operate. Have you ever stopped to think what a saw of this type is expected to do? An 18-in. circular saw has a circumference of about 56½-in., which is virtually 4 2/3 ft. Travelling at a speed of 1,800 revolutions, this saw actually runs 8,400 ft. per minute, or 96 miles per hour, or 768 miles in an eight-hour day. This represents the blade travel only, which is but a small factor, considered with the strain which is placed upon the rapidly revolving saw during forced feed.

A conception of the terrific strain to which circular saws are frequently subjected may be had when you consider that with a 56-in. circular saw, travelling at 900 revolutions, the feed is usually 16 in. for every revolution of the saw. A saw of this character operated in hard yellow pine must necessarily be driven by an engine belted direct to the saw and with a 24 to 30-in. belt. The ordinary means of power transmission could not budge it. The steel to be used in saws for this class of work must show a tensile strength of 240,000 lbs. per square inch. Needless to say the constituents of material of this character must be of the highest quality and exquisitely handled throughout the various processes of manufacture.

Requirements of Band Saw

Consider the requirements of a band saw running at a speed of 10,000 ft. per minute—10,000 ft. per minute is equal to 600,000 ft. per hour, or approximately 113 miles each hour, or say 900 miles an eight-hour day. In the face of this terrific speed it is possible to make band saws that will stand up without refitting for from three to five hours (and sometimes longer) or after having made a blade travel from 300 to 600 miles, through hard, tough, resinous timber, including such trifles as knots, burls, and occasional rafting spikes and even cannon balls. The blade travel, however, is again only a consideration. The required strain which a 16-gauge, 8-in. band saw must withstand is figured at about 4,150 lbs. This steel must also undergo a test showing a tensile strength in excess of 240,000 lbs. per square inch.

Again, not only must the saw stand these strains, but it must have a high degree of toughness, rendering it susceptible to a spreading of the teeth in swaging of at least 50 per cent. or to be sideset at almost any desired angle. Then, did you ever consider the enormous bending strain to which a band saw is subjected? The bending of a band saw over the wheels, figured at the number of bends per day, indicated in a measure the high elastic limit necessary for a good band saw. This must be, approximately, one-half its tensile strength. The test of a band saw plate for bending qualities is made by fastening the blade stationary at one end, and attaching the loose end to a machine which moves backward and forward constantly. Steel which is of such consistency and so tempered that it will withstand this bending process indefinitely is only used in band saw blades.

All these things having been accomplished, the saw must still hold its cutting edge, and not become easily dulled, thus reducing the cost of up-keep to the minimum. Perhaps the most serious task that the saw must perform, after all, is to overcome the prejudice of the filer, who prefers another brand of saw, and who, sometimes, with malice aforethought, will operate a really fine saw at a disadvantage in order to get his favorite brand in use at that mill. Efficiency is becoming a by-word nowadays, and saws have kept up with the profession. The requirements of a saw to-day are far in excess of those of a few years ago. Formerly a hand feed rip saw running at 60 ft. per minute was used.

Quality and Efficiency

There are two factors entering into the manufacture of saws, which, above all else, it is necessary for the maker to thoroughly master. These are the quality of the material used, so as to secure a finished product which will stand up to its work, and secondly safeguarding his processes of manufacture, in order to procure the highest degree of uniformity, not only throughout the blade itself, but in making, month in and month out, blades of absolute similarity. Any inaccuracy in the constituent parts of the material which goes into a saw blade is quickly noted through the analysis to which the finished plate is subjected in the chemical laboratory.

In the old days, a saw was considered properly tempered when the furnace man supposed that it had reached a certain degree of cherry red. To-day, the heat treatment, through the processes of hardening and tempering, are prescribed by the chemist, and administered to the blade through the use of mechanical devices which insure accuracy. All guess work, judgment, or whatever you might call it, have been succeeded by scientific methods, which, while expensive and adding to the cost of the finished product, insure the least possibility for any variation which might retard the result giving qualities of the finished saw. The proper grinding of all types of saws is an absolute essential; not only the grinding of the gullets to the teeth, but the desired variation in the gauge of the thickness of the blade itself. For this work the saw maker has invented machinery which insures the greatest accuracy.

The hammering or smithing which gives the saw the proper tension is necessarily in the hands of the highest skilled artisans. The swaging, shaping, finishing, polishing and other processes resolve themselves into minor considerations as compared with the features of material, heat treatment and proper tensioning. The various types of saws used in the box factory are familiar to each of you. Their uses to procure the most economical results are best known to you, who have made this subject a life study. The actual making, however, of a saw, such as you must reasonably expect to receive in these present days of high tension, means an unusual equipment not only as to machinery, but knowledge and experiences on the part of the maker. I have told you only a few of his problems which it has been necessary for him to overcome.

The Market for Waste

THERE is a new philosophy in regard to waste, one that may seem at first like a difficult dose to take, but it is good philosophy to get into one's system, just the same. That new philosophy is, "If you have any waste it is because you haven't discovered a market for it, not because there is no market."

This is nothing more nor less than the adoption of that truism that everything has a purpose if we can but find that purpose. In other words, nothing is made in vain, and most of the things that go to waste in the process of getting out and working up our natural resources go to waste simply because we have not yet perfected methods of manufacture and the process of getting together, that we may find the right place and the proper use for everything. This is a good philosophy to think over, even though you may have experimented with waste utilization and been disappointed. In such cases the trouble is not in the original idea of utilizing waste, but in the lack of having developed facilities of the right kind for converting.

Developing utilization of waste calls for work along two lines. One is that of finding the best practical market, or, rather, what form any given waste may best be marketed in, and the other is that of methods and appliances and ways and means for handling waste that it may be converted into a salable and usable product without the cost of conversion being so great as to eliminate the chances for profit.

We are just beginning the solution of the waste problem and proper utilization, and naturally we make many false starts and meet with a discouraging share of disappointment. In the matter of converting and marketing waste it is well to take the new philosophy and keep it before one, for it is generally true that when you have a waste it is more because you have not discovered a market for it than that there is no market.—Veneers.

What a Foreman Should Be

I have seen foremen and superintendents look with contempt on the rank and file of mill men, writes N. M. in Woodcraft. They have forgotten when they worked with the rank and file and feel they must not mingle with or associate with their men out of working hours.

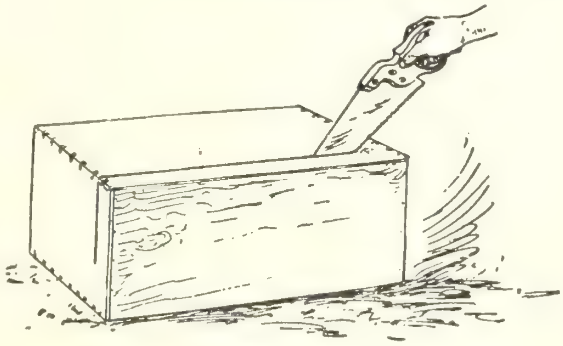
The necessity for this attitude, if there be a necessity, depends I think, on the man and the men. I cannot see that such association would detract at all from the foreman's authority over his men during business hours. Business is business and the ideal foreman or superintendent can be just as friendly and pleasant with his men as he wants to and yet keep all his dignity and firmness.

When a foreman gets the good will of his men and they understand his qualities, he can get any amount of work out of them pleasantly but he must be strict in discipline and business all the way through. And yet, when occasion arises for reprimand, he must do it to perfection, not an oath in it. The offender would not forget it in a hurry and the peculiar part of it is, the offender is made to feel that he is wrong every time and does not harbor any hard feeling afterwards.

A mistake some foremen make is that they are too distant and "high and mighty." Such men can sometimes push out a lot of work by driving methods, but how much better for all hands to be pleasant and considerate as well as firm. All of us are human. And when a man is doing wrong, would it not be better to have a fair and square talk with him as a man, instead of "firing" him as is so often done? I think that "firing" is sometime done to show authority, but that is a mighty poor way to show it. There are, of course, times when it has to be done, but I believe many a man can be kept and made a trusted and valuable employee by being handled the proper way. I have found it so in my ten years of handling planing mill men.

Making a Tool Chest

If you desire a chest or box with a trunk or recess cover, you can make the best job by putting your box together and fastening up the sides and ends, top and bottom, by dovetailing or otherwise. With a gage you make a line parallel to the top edge and far enough down the sides to provide a lid or cover of desired depth. The box is then sawed along this line with a rip-saw. This will cut fairly smooth, and a very slight finish along the sawed edge is sufficient to complete the work. If your saw cuts smoothly, merely sandpapering will do in same cases, and you will find the cover to be a nice fit.


Illustrating Method of Making Tool Chest.

A new product which is expected to be of great value as a substitute for natural wood, has been found in France, after years of study and practical experience. The process, which is said to have given satisfactory results, consists in transforming straw into a solid material having the resistance of oak. The straw is reduced to a paste by boiling, to which certain chemicals are added. When the paste has been reduced to a homogeneous mass it is put through another process and planks, beams, laths and mouldings of all kinds are readily made. This new material is said to be capable of being sawed like natural wood, and that as a fuel it emits a great flame and little smoke.

An immense red fir tree about six feet in diameter, was cut down recently in Albany, Ore., and was found to have a heart of solid and genuine charcoal, for about 15 feet up from the ground. No explanation is to be found for the freak.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Q.—"We have the re-design and arrangement of our mill in mind, and desire your opinion as to whether or not real advantage is obtained by the use of the various devices for saving oil and reducing friction in line shafting and other transmission bearings. We have in mind: (1) grease in plain bearings; (2) ring oiling bearings; (3) wick oiling bearings; (4) ball bearings; (5) roller bearings. We are in doubt as to what to select. Our power is electric."

A.—So long as you buy electric power your first consideration is to prevent all the loss in transmission that you can. Where babbitted bearings are used the power lost in them depends upon the quantity and quality of the lubricant supplied, but under the very best conditions, the cost of their operation as compared with ball or roller bearings is prohibitive. Where there is plenty of power, as in a steam plant operated by waste, shavings, etc., or a water power plant that is larger than is required, it is all very well to stick to babbitted transmission, but where the saving of power becomes an object, ball or roller bearings is the solution. Where shaft speed does not exceed 400 r.p.m., split roller bearings that can be placed and removed without disturbing the shaft are by all means the best. The points of contact between rollers and shaft are long and not susceptible to slight or even pronounced faults in alignment, and they require the least attention and oil of any bearings on the market. When the speed exceeds 400 r.p.m., such as in counter shafts, loose pulleys, etc., the ball bearing finds its field of usefulness, and for high speeds and where it can be removed from its shaft without disturbing much of anything else or causing undue trouble, it will save many times its cost in power, lubricant and labor.

Bearings which cannot be made ball or roller, are best lubricated by good grease, in either force, hand or gravity feed cups. If you will write to the following people, they will be glad to give you further information and data to substantiate their claims:—roller bearings, Williams & Wilson, Montreal, Que.; ball bearings, Chapman Ball Bearing Company, Toronto.; grease, The Mackeen Company, Montreal, Que.

Remember, however, never to use a roller shaft bearing at over 400 r.p.m., and never use a ball bearing in the middle of a shaft or where it cannot be removed without too much labor and delay.

Q.—"I should be pleased to learn through your valuable paper the proper method of folding up a bandsaw?"

A.—The method of folding depends upon the size of the saw. Anything over half an inch wide is better not folded at all, but kept on a rack, while for saws under half an inch wide, the following method is used which results in folding the saw in a coil about 12 or 18 inches in diameter, which is readily hung on a peg, takes up little space, and requires no binding to keep it in place until it is unwound in the proper manner. Extend the saw on the floor in front of you in the same shape that it made when on the wheels. Grasp it with both hands at one end and turn that end only, inside out three times in the same direction. Then bring the ends together, allowing the saw to twist as it will, and it will fold up into a small coil, from which it can be extracted only by reversing the twists. It may take a little practice to accomplish this, but once done it will always seem easy, and is the best way to store the saw when not in use.

Q.—"We have been trying to saw hard wood, ten and twelve inches wide, on our six-inch band saw, but without success. This saw works perfectly at a high rate of feed in the worst kind of soft wood, and we cannot understand why it should lay down on the hard wood under the extremely slow feed which we gave it."

A.—The chances are, that having given such good results in soft wood, your band saw is speeded too high for the same results in hard wood, the sawing of which is a different proposition altogether. Reduce the speed of the saw to around 7,500 or 8,000 feet a minute and use a saw not thinner than 18-gauge, with the teeth spaced about 1⅜ or 1½ inches apart at the points. Do not feed too slow, but experiment until you get the feed that gives the best results.

Q.—"We have been discussing the reason why our feed water is hotter when running high pressure with the exhaust through the feed water heater than when running condensing with the heater between the engine and the condenser. It seems to me that the steam should expand more under the vacuum and come in contact with more of the heater pipes and so give the same or a higher temperature as when running high pressure, while others claim that the increased speed of the steam under vacuum prevents the heat contained in it from being taken up by the water in the tubes of the heater. We are all agreed that the heat is there; where does it go?"

A.—You are all mistaken. Steam, as you can verify by any Engineer's Hand Book, varies in temperature with the pressure under which it is confined. Steam at atmospheric pressure is 212 deg. Fah., and as your engine was exhausting to the atmosphere through the heater under a slight back pressure of perhaps two or three pounds, the temperature of the exhaust steam was about 220 deg. Fahr., which gave you the highest temperature in your feed water. When we go below atmospheric pressure, however, water boils at a lower temperature, depending upon how far you go (as will be seen in the table below) until at about 23 inches, which is the average for steam plants. The temperature of the steam is only 141 deg. Fahr., so that it would be manifestly impossible to heat the feed water above that point. The total heat in the steam is there, however, but in consequence of expanding into the vacuum there is more of it, or a larger volume, but at a correspondingly lower temperature. In other words, while you cannot raise the water above the temperature of the steam, you can heat more of it to that temperature, thereby obtaining as much heat as at high pressure, provided you have a use for the water in excess of the boiler requirements. This seeming loss when running condensing is so greatly overshadowed by the saving of running the engine under vacuum, which adds from twelve to fifteen pounds to the steam pressure, that what heat is not used by the boiler feed water is allowed to go to waste without regret.

Vacuum in inches of water	Temperature of steam Deg. F.	Vacuum in inches of water	Temperature of steam Deg. F.
29.74	32	9.56	193.22
28.89	80	7.52	197.75
27.88	101.83	5.49	201.96
25.85	126.15	3.45	205.87
23.81	141.52	1.42	209.55
21.78	153.01	Lbs. Pressure	
19.74	162.28	Atmosphere	212.00
17.70	170.06	0.3	213.00
15.67	176.85	1.3	216.30
13.63	182.86	2.3	219.40
11.60	188.27	3.3	222.40
		4.3	225.20

The Constituents of Metals

The April number of the Canadian Woodworker Question Box contained a query relating to the composition of Babbitt Metal used in woodworking establishments. The following table gives the constituents of various metals as analyzed by the Penn. R. R. Laboratory at Altoona.

[COMPOSITION]

Metal	Copper	Tin	Lead	Zinc	Antimony	Iron
Camelia	70.20	4.25	14.75	10.20	.....	0.55
Anti-friction	1.60	98.13	.....	.....	.....	trace
White metal	.....	.....	87.92	.....	12.08	.....
Car brass lining	.....	trace	84.87	.....	15.10	.....
[1]Graphite bear. met.	...	14.38	67.73	.....	16.73	.....
Antimonial lead	.....	.....	80.69	.....	18.83	....
[2]Carbon bronze	75.47	9.72	14.57	.....	.....	.....
[3]Cornish bronze	77.83	9.60	12.40	trace	.....	trace
Delta metal	92.39	2.37	5.10	....	.....	0.07
[4]Magnolia	trace	trace	83.55	trace	16.45	.....
Amer. Anti-friction	.....	.....	78.44	0.098	19.60	0.65
Tobin bronze	59.00	2.16	0.31	38.40	.....	0.11
Granley bronze	75.80	9.20	15.06	.....	.....	.....
Damascas bronze	76.41	10.60	12.52	.....	.....	....
[5]Ajax metal	81.24	10.98	7.27	....	.....	.....
[6]Manganese bronze	90.52	9.58	.....	.....	.....	....
Anti-frictional	.....	.....	88.32	.....	11.93	.....
Harrington bronze	55.73	0.97	.....	42.67	.....	0.68
Hard lead	.....	.....	94.40	.....	6.03	.....
[7]Phosphor bronze	79.17	10.22	9.61	.....	.....	.....
[8]Extra B met.	76.80	8.00	15.00	.....	.....	.....

[1] No graphite. [2] Possible trace carbon. [3] Trace phosphorus. [4] Trace bismuth. [5] Phosphorous or arsenic 0.37. [6] No manganese. [7] Phosphorous 0.94. [8] Phosphorous 0.20.

There are fifty-five oaks in the United States, about evenly divided between the east and the west. The eastern species, and particularly white oak, are the most valuable.

When laying veneer, such as butt walnut or crotch mahogany, if you have trouble with the veneer checking where the headwood is, rub powdered asbestos well into the headwood before gluing, and it will prevent the checking.

Qualities of Black Walnut

One of the strongest points about black walnut, which is coming into demand for domestic consumption again, after having been exported for the most part for the last fifteen years or more, is its ability to stand refinishing. Some woods, which do not wear so well, look splendidly after their first finishing; but if it becomes necessary to go over them after a service of a few years, it is found that it is very difficult to restore anything like the original good looks of the materials.

Walnut has been selected for use in many places just on this account. Take the matter of telephone boxes, for example. These are subjected to rough usage, are sometimes not properly protected from the weather, and are not looked after carefully. Walnut is used in making these boxes, not only because it resists moisture exceedingly well, but because it can be rubbed up and refinished without difficulty, looking just as well as ever.

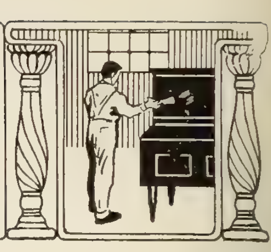
The furniture manufacturer who wants his goods to stand up under generations of use takes into account the durability of the wood, the way it stands wear and the ease or difficulty with which it can be refinished. One of the reasons for the renewed popularity of walnut with the general public is that those who have taken the walnut furniture of another generation, refinished it and put it back into use, have found that it looks as well as though it had just come from the factory.

This ability to stand wear and tear, and still be good after long service, is a great and natural argument in behalf of black walnut, and one which appeals to the manufacturer who is building for the future as well as merely for the present.

Hints on Oak Working

Oak, whether plain or quartered, is comparatively easy wood to work smooth, says a writer in the Southern Furniture Journal. It is not a soft wood; what is meant is that oak can be worked on a planer and get a smooth finish with knives that are a little dull. The same thing is true in working it with saws. When it comes to gum and some of the other woods, the knives and saws must be perfectly keen to give good results. When it comes to sanding, however, it is different, and gum and some other even grained woods may be handled with comparatively smooth or even slick sandpaper with fair results, but when it comes to sanding oak, to get a good finish the sandpaper should be fresh and sharp. This is because of unevenness in the texture of the wood. If it is plain oak there are the hard streaks and the soft streaks of their annual rings of growth and if they are sanded over with dull paper it will cut down into the soft streaks. The hard ridges would be alright for a certain kind of finish, but where a perfectly smooth face is wanted oak should be sanded with a sharp, keen paper. If it is quartered oak it is the same thing in a different way. There is a hard film, which makes a splash line which nothing but sharp paper will touch, and if the wood is sanded over with dull or slick paper it will simply dig down between the splash line, leaving them standing up in waves. To obtain good results the operator should not only have sharp paper but should get the sanding across the grain of the splash line to reduce the tendency to cut down the soft places between.

THE FINISHING ROOM



Practical Methods of Building up a Staining Color

Specially contributed by Walter K. Schmidt

THE finishing room of a woodworking industry, particularly a furniture factory, is the department of which perhaps least is known by the management when it comes to questions of cost and materials used. It has been a department by itself, and as long as the results obtained were sufficiently good to admit of the selling of the goods, it was allowed to run along, because there was a certain myth about it. It had its sanctum, and everyone connected with the factory felt much like the small boy when he sees the photographer put a black cloth over his head to take a photograph. There is a certain mysteriousness about it, which is allowed to continue because everybody about the institution has come to believe that it is a thing not to be disturbed; so the factory is departmentized, system is put in, an expert buyer is on the job, but few of them have tackled the finishing room.

The writer has spent a good many hours in a laboratory, with the result that formulas have been produced that are in daily use throughout the western hemisphere. Like every other chemist that advances new methods, new ideas, improvements upon conventionalities, these innovations have been taken up by the alert manufacturer or the foreman finisher. The manufacturer who is willing to concede that the rule of thumb may be giving him results, and in a measure is satisfied when his stock is paying him 6 per cent., will wake up to find his younger competitor overtake and ultimately defeat him in the competition.

My object in referring to this subject is to get the reader of the trade paper to give a thought to the articles. I know from experience that many manufacturers subscribe to trade papers, advertise in them, but rarely read them. Here is a letter from a foreman finisher, asking about a quick way for making a certain finish. The very thing about which he writes was published in the preceding month's issue of a paper that had been mailed to that factory for years. Incidents of this kind could be multiplied. What is more, the names of the manufacturers and those of their department heads could be put under each item, showing distinctly that both ends of the factory are as yet not working in that harmony which spells success. Business and manufacturing are in a state of evolution, our vast natural resources are coming to such a state that economy is the prime factor in the movement to keep up the dividends. As overhead expense, cost of living, cost of selling, etc., increases in the same ratio either stocks have to be turned over oftener, or the cost of production decreases correspondingly. You may answer: "if goods cost me more, I shall get more for them," but try that percentage in a direct ratio to the overhead cost, and see if you can balance the equation.

In giving formulas, they are made with the view of obtaining results at the minimum cost. We have seen the spraying machine universally condemned, but to-day it is a fact. One man will shellac, stain and even varnish as many pieces as heretofore five or six men could do. The varnish kiln reduces the time, dries uniformly and you can figure almost to an hour when the stock will be ready for the next coat, or for rubbing. Yet, when the suggestion to install one of these machines is made to the manufacturer it is frequently given a chilly reception at the hands of the department head. On the other hand, if the manufacturer orders the machine, puts it in and gives instructions as to its use, in a few weeks' time everybody wonders how he got along without it. It is natural for human beings to object to labor-saving devices. The laborer thinks that the machine deprives him of his livelihood. Supposing it does reduce the number of employees in the finishing room, it may be said that it will be a case of the survival of the fittest. The production of the goods will be able to keep pace with competition.

In one of my preceding papers I referred to methods for producing two of the now popular finishes. At the last sales season, a good deal of gray was shown. It lacked the general uniformity that comes to a style after it has been on the market for some time and has become conventional. There are always radical ideas as to the proper shade. The inception of the color may have been correct, but not being made by uniform methods, and being produced in so many roundabout methods, there is a vast variety.

It is the writer's intention in these articles to convey to the reader the fundamental knowledge and methods upon which a color is built; also the method by which the shades can be diversified. The information is founded upon actual experiments, and better still, on actual methods as produced by the advanced manufacturer. At all times bear in mind that he who undertakes the production of stains by these methods must familiarize himself with the working of his ingredients. The housewife undertakes to bake a cake after a certain recipe. She uses the quantities given very carefully, and she watches the results. The next attempt is not so difficult, and eventually she becomes expert. In speaking of the grays, therefore, let me say a word about our American woods. Before long maple and birch will come out in a style of finish and color of their own. In Germany and Austria gray maple has been made for many years. I predict that our grays will also be on these two woods as much as upon oak.

The production of the gray depends almost entirely upon the tannin or tannic acid present in the wood, changed to a tannate of iron by the application of a weak solution of iron salt. Sulphate of iron, chloride of iron, in fact, any salt of iron will do the work. Iron having an affinity of tannic acid produces a tannate of iron, which is nothing more than an old style ink. Our problem then is uniformity of color. To produce an iron stain of uniform strength, I recommend the official solution of chloride of iron or sulphate of iron. These are standardized solutions of definite strength. They form the unit from which a medical solution of iron is made, and therefore may never vary in their strength. You can readily see how the employment of this as a source of iron will give the uniformity of color which is absolutely necessary when this chemical is used as a stain. The amount of iron used to the gallon of water is so small that I recommend the addition of a small amount of nigrosine, which is a black aniline, so that the manipulator of the stain can readily ascertain where the color has been applied and where not. This helps to avoid the lapping of the stain. Then, again where there is a slight greenish cast to the gray I recommend the addition of a bit of yellow. This corrects the stain and keeps it in line with the grays.

Uniformly selected woods will give a very even shade of gray. There are cases where the depth of color cannot be obtained, in which event it is only necessary to coat the work with a very weak solution of tannic acid, supplying the deficiency in the wood. We have now at hand the simplest way of producing a gray. By changing the strength of our stain by the addition of various quantities of tannin to the wood, we have under our control the absolute production of any shade of gray that is possible to produce upon wood. The style here is to coat this wood with a white filler. This is made by using zinc white and carbonate of zinc, which cost from five to seven cents per pound in the dry form. These are mixed with turpentine, and lengthened with naphtha. Coat the wood, let it dry, and wipe off with coarse rags or rub with burlap. Where there is not much wear to the wood, or after the filler has been applied, coat with wax, let the wax set for an hour or two then rub to a polish. This will bring out its beautiful light gray. On the other hand if the solutions have been intensified and employed on oak, a rich finish will be produced which looks like an Antwerp, finished with the white filler, and known as silver oak. As to cost, a gallon of iron solution will cost less than three cents. A gallon of tannic acid solution, using from a quarter to half an ounce to the gallon, will cost about three and a half cents per gallon. The amount of nigrosine employed is so small that it cannot be figured in the cost at all. Wax finish is less than shellacing, is better than the use of laquers and at the same time costs less.

I invite practical experiments on the three woods by the above method, being confident that the reader who has occasion to make a gray finish will be henceforth a supporter of the trade paper that furnishes him with practical and authentic information.

A Practical Discourse on Wood Staining

By A. Ashmun Kelly in Veneers

A large furniture manufacturing concern in Michigan writes as follows: "We are desirous of obtaining an oil stain that will give the same effect on quarter-sawed oak as the fumed oak acid stain. At the present time we are using a combination filler and stain in the fumed oak color, but this does not give us the desired fumed effect, or the well-known nut-brown color. The acid stain raises the grain of the wood, obliging us to sandpaper afterwards, and we would like to get an oil stain or combination filler and stain that will give us this nut-brown color, as described and desired by us; would like to know if any such is manufactured."

I have laid the matter, together with a sample of the stained and filled wood that is to be done or matched, as described, before one of the largest manufacturers of wood-finishing things in the country, and I await the report; they are trying to secure a satisfactory stain as described above.

In a general way, all stained oak may be said to be imitation of real fumed oak; the wood is more or less darkened, from nut-brown or coffee color to black. The fumed effect is richer than any other method of staining, but water and oil colors, too, will give very fine imitations, as will also the application direct of ammonia. But there is the inevitable raising of the grain where water or acid stains are used, and while oil stain does not do this, yet we do not get as good a result or effect as with the water or acid stains. There are ways of modifying or removing the effect known as grain raising, but evidently our inquirer wants to save this expense, trouble and time, and it is essential in the finishing room to make this saving. But to use the grain-raising stains and not get the raised grain is something no one can accomplish.

Speaking of raising the grain and cost of removing effect, or more specifically, saving money in the finishing room, they are doing this in many shops now by using a spraying apparatus, which applies the varnish coats from first to finish, yes, even the primer; and for auto body work the sprayer puts on even the rough stuff. If we can get this sprayer to apply a water stain so that it will not raise the grain of the wood, we shall think the impossible has been achieved. Perhaps by applying water stain in minute amount and causing it to dry immediately the raising would not occur, or at most only in a minor degree. This is worth looking into.

For darkening wood, oak, we may use a potash solution, and get any shade from nut-brown or coffee color to almost black. Make it very strong and we get a very dark red color, a deeper tone than ammonia gives.

Fumed oak may be imitated with a water stain made thus: Boil an ounce of catechu (gambier) in 1 quart of water, and then strain it and apply to the wood while hot. When this has become dry, brush it over with a solution of 1-oz. of bichromate of potash solution in 1½-oz. of water. A second application of this will give a deeper color.

When liquid ammonia is used to imitate fumed oak, use a mop, and be careful about getting any on your hands.

Another imitation fumed oak stain may be made with iron filings dissolved in sulphuric acid, which dilute with water; give the wood several coats, according to depth of shade desired.

Raw umber in oil gives a very nice nut-brown tone, that might pass for fuming, and, being an oil color, it will not raise the grain of the wood. Or some zinc white may be added to the umber, which will modify the tone and also serve as a filler, if enough is used. Use the zinc white that is ground in oil; this gives a dull brown. Some mix equal parts of brown japan and turpentine and thin up a mixture of burnt umber in oil and a little lampblack in oil; this mix-time is applied freely and made quite thin. Just as soon as this color sets, wipe off the surplus from the wood, then fill the wood with a natural color filler, paste filler being indicated. Then wipe off the surplus filler and finish with wax, if desired. This gives a very satisfactory color and finish.

Ammonia applied directly to the oak will give a fumed effect, the liquid being used full strength, 26-deg., or diluted, according to degree of color desired. This is a quick way, but has the fatal objection of raising the grain of the wood. When using the ammonia one must work in the open air or in a well-ventilated room. The open air is best, with your back to the wind. Cover the surface evenly and rapidly, and do not permit any part of it to dry until the whole is done, or before the work is done so far as you have gone. With chairs, etc., this is not so easy, as some of the liquid is bound to run onto parts already done, causing clouds. But this applies equally well to oil stains, of course, for they do not dry fast, and may be brushed out at any time until the work is done.

With ammonia and all water stains it is best to not use too strong, but to dilute sufficiently. Vandyke brown mixed with ammonia gives a very fine dark-brown shade; make it into a paste, adding this to a saturated solution of bichromate of potash. Diluted, this, as stated, makes a good dark-brown, and may also be made to imitate walnut.

After an object has been fumed with ammonia fumes it may be coated with a mixture of equal parts of boiled oil and turpentine, to darken the fuming slightly, and giving the color another effect.

Surface Preparation and Paint

THE surface on which paint is to be applied plays an important part upon the wearing qualities of that paint and upon the character of the paint required. A rough or absorbent surface such as absorbent brick, soft wood, corroded iron, etc., will require paint that has more thinner to pigment and oil, than will clean steel, tin plate, etc. In the one instance the paint must be more or less rooted into the material underneath which is accomplished by a paint which has more liquid to give penetration, and in the other case, it must be held almost entirely by surface attraction. Hence, liquid which causes penetration on an absorbent or rough surface is not desirable here. Wood contains water, sap, ligno-cellulose, and mineral matter, the two former being repellent of paint. The heartwood of trees is generally more receptive to paint than sap wood, but a notable exception is yellow pine. Sap wood costs less than the heart, and takes paint better. Therefore, if properly protected by paint, the paint will last longer, and consequently sap wood yellow pine will last longer than the heartwood, and is to be recommended for use.

When the temperature on a metal surface is less than that of the surrounding surface, more or less sweat or water of condensation will always be found on it. This is detrimental to securing a proper paint finish, as is also any grease that might in any way be on a surface. Paint will only stick to a receptive surface that is warm and dry, and will not take properly on a greasy, cold or damp surface. Paint or varnish should never be applied over a wax finish. Some metals not only hold paint better than others, but they also affect it differently. Paint does not adjust itself readily to metallic zinc or galvanized iron (iron coated with zinc). A paint spread on clean metallic lead will dry much more quickly than one spread on clean steel, owing to the fact that the paint is made to dry quickly by the lead, which is a drying agent, and therefore, does not dry naturally by the air as it should, and does not last so long. A rough surface will hold paint better than will a smooth surface, and paint on a rough surface will wear longer, due to the fact that the paint coating is thicker, and also that the surface being rough, the paint grips in with greater tenacity than it would on a smooth surface.

The Varnish Drying Room

By R. Kilbourne

THE question of what is the best way to dry varnish is receiving considerable attention at the present time, and many of the arguments advanced in favor of some particular system are the result of a lack of understanding of what "drying" varnish really is. Many persons are under the impression that drying varnish is like drying wood, and is brought about by throwing off moisture. That would be a mechanical operation. But the drying (or hardening is a better term) of varnish is not a mechanical, but a chemical, operation, and is scientifically termed oxidation.

During the process of hardening varnish throws off very little moisture. On the contrary, it consumes large quantities of oxygen. The process in simple detail is as follows: The varnished surfaces are spread out in such a way that the air may pass freely over them. As the air, in circulating through the room, comes in contact with the varnish, the varnish absorbs the oxygen from the air, and at the same time throws off hydrogen gas, which is carried away by the air as it passes along.

It is cause for considerable wonder to some people why varnish will dry, or harden, much more rapidly in a temperature of 75 deg. F. in the winter, than it will in a temperature several degrees higher in the summer. This is explained by the fact that the air in winter contains less moisture and more oxygen than is usual in summer. A certain amount of moisture in the atmosphere may be necessary to prevent consumption of the oxygen by combustion, but humidity is not essential to the proper drying, or hardening, of varnish, apart from its effect upon the oxygen.

If the wood work will stand it, the temperature of the varnish room may be run up to 120 deg. F. at night, in order to hasten the drying of varnish. And if proper provision is made for a constant supply of fresh air, in order to keep up the supply of oxygen, the varnish will harden perfectly and many days be saved in the time required. Fresh air may be admitted to the room by lowering the windows slightly at the top. It would be better to have several windows, lowered 1 or 2-in. each, than to have one window lowered 1 ft. or more. The former method will give a more uniform diffusion of the fresh air. The latter method is liable to chill some part of the work by bringing it in contact with a large volume of cold air before the cold air has had a chance to spread itself throughout the room.

The best way to keep up a supply of fresh air is by a series of ventilators placed at intervals in the ceiling. These should be so constructed that they may be controlled so as to increase or reduce the quality of air at will. As the temperature of the room rises the ventilators should be gradually opened to admit a gradually-

Varnish Brushes

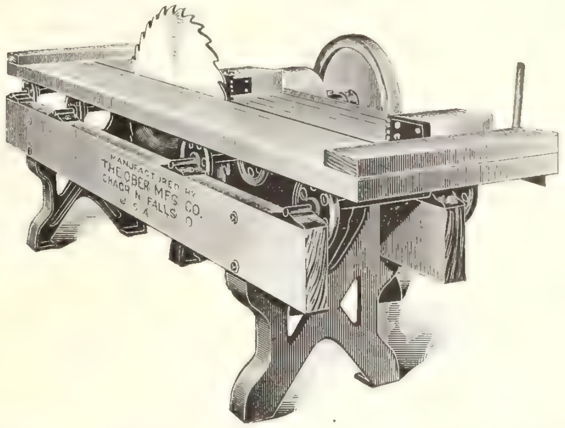
"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.


MANUFACTURED BY
THE OBER MFG. CO.
CHAGRIN FALLS, O.
U.S.A.

The Hand Feed Bolter

is the most PRACTICAL MACHINE for working short HICKORY logs into HANDLE BLANKS.

THE MACHINE SHOWN HERE IS ONE OF THE BEST.

Write for free catalogue No. 31 of **Bolting Saws, Rip Saws, Chucks, Turning Lathes, Sanders, etc.**

It will pay you to investigate THE HANDLE BUSINESS.

Information freely given on application.

THE OBER MFG. CO., Chagrin Falls, O., U. S. A.

"50"
FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and **does not show brush marks.**

R. C. Jamieson & Co., Ltd.
Established 1858
Montreal Vancouver

Owning and operating P. D. Dods & Co., Limited

OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

increasing quantity of fresh air, until the maximum of temperature and fresh air required has been reached.

From the foregoing it will be seen that varnish cannot harden properly, after a certain length of time, in a tightly-closed room, because the air will soon become heavily charged with gases thrown off by the varnish, and also become depleted of the elements essential to oxidation. That the atmosphere of such a room is almost, if not totally, depleted of oxygen is proven by the nauseating effect upon a man when he first enters, and the debilitating effect if he continues to breathe the air.

One writer on this subject says:"It is rather hard to understand how, if one ventilates the room, taking outside air, he will prevent the drying conditions continually changing." To my mind this is not a very serious problem. Where is there a system that does not have to meet the same difficulty? Outside conditions are constantly changing, and whether the air from the outside enters the room or not, the inside of the room is affected by these outside changes.

It is to meet and counteract these changes that we have controllable heating systems. It would be too much to expect any system to keep absolutely uniform inside conditions, but the variation need not be so great as to interfere to any very great extent with the proper hardening of the varnish. A gradual rise in temperature from 75 to 120 deg. F., or a gradual fall in temperature from 120 to 75 deg., will not injure any good varnish. A drop in temperature from 75 to 50 deg. F., during the early hardening stages, would do many time more harm, although the change is less than half as much.

Casehardening in varnish is not the fault of the system by which the varnish is hardened, but the fault of the varnish itself. The writer has had over twenty-five years' close contact with finishing-room methods and thinks he knows whereof he speaks. Almost every finisher of experience has had occasion to try out several samples of varnish at one time, and has given each the same hardening conditions. And what was the result? One sample would dry dust-proof in from one to three hours, while others would require from three to ten hours. I have before me the result of several varnish tests under identical drying conditions. Test No. 1: "Dried dust-proof in one and one-half hours, after which hardening continued very slowly." Test No. 2: "Dried dust-proof in seven hours. No perceptible change until the third day, when it hardened completely in a few hours."

If my process of reasoning is sound and my conclusions correct (and I think every finisher will say they are), then all that is required to make it practical to turn the finishing or varnishing room into a drying room at night, is a system whereby the foul air may be driven out and fresh, cool air substituted, with a gradual lowering of the temperature to 75 deg. F. This can be done by the use of one or more fans, according to the size of the room. These fans should be located near the top, at one end of the room, and should draw the foul air outward. At the other end of the room, near the floor, should be one or more warm-air flues to supply fresh air to take the place of that carried off by the fans. The air should enter the room at a temperature of about 70 to 75 deg. F. This system allows the temperature to be reduced to 75 deg. in about two hours, and leaves the room in much better shape for men to enter and work in, than are the majority of finishing rooms to-day.—The Wood-Worker.

D. H. R. ENAMELS

We are getting out a new set of samples showing the various shades in French Grays and Ivories as well as White with a transparent Display Card showing the effect of the piece of furniture when finished.

You will find them very useful in showing your customer just what the goods will look like when finished. These are very original and will be sent on request.

D. H. R. SPRAY UNDERCOATS and SPRAY ENAMELS

have proved the most practical and satisfactory where you are equipped for spraying and our experience of several years in making goods best adapted for spray work relieves you of the necessity of experimenting with goods that have not stood the test of time.

Our Demonstrating Department is at your service.

Denny, Hilborn & Rosenbach
PHILADELPHIA

Oil Soluble Stain Powders

Try our latest and best production.
A perfectly Oil Soluble

Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Walter K. Schmidt Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

ANGLO RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

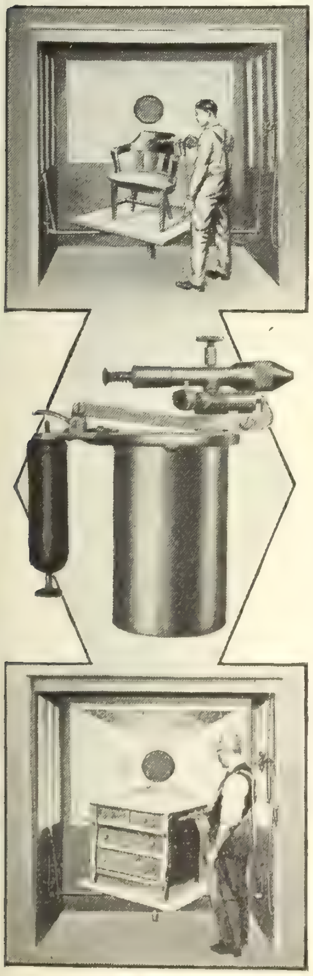
The Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

THE GLUE BOOK

WHAT IT CONTAINS

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
Nicholls Building, Toronto



A Big Cut in YOUR Time and Labor Cost and a Higher Quality Finish

is the positive result of AERONING your product.

The AERON shellacs, varnishes and enamels any and every class of furniture with air, supplanting the slow-going hand brush method of finishing. It enables one man to do the work of two to eight with a brush, effecting a saving in time of 50% and upwards.

Equally important to you is the fact that the AERON applies a perfectly uniform surface—no brush marks, thin spots, runs, sags nor fatty edges. Thus a HIGHER QUALITY FINISH along with the reduction of two big cost items.

Aeron SYSTEM of Furniture Finishing

Paints With Air

has been installed by hundreds of furniture manufacturers, and the above statements are based on their actual, average results. We often receive reports, too, of an actual saving of a coat or more of material in Aeroning—at the same time getting a much better quality job.

In Aeroning every place difficult of access is readily reached; rough, irregular surfaces are as easily and finely finished as the smoothest ones; the ever-present cost of expensive brushes is totally eliminated. The AERON is simple of operation. The entire Equipment and service is absolutely guaranteed.

The DeVilbiss Mfg. Co. 1318 Dorr St., Toledo, O.

Let us send you detailed Information and Catalog. A post card brings both by return mail.

Veneers and Panels

Drying and Storage Facilities for Veneers

Specially contributed by Leonard A. Blake

NOW that the subject of the gluing and mechanical part of veneer work has been considered it will be well to proceed with the question of storage and drying—storage as it affects the keeping of veneers not used immediately after manufacture, or veneers that are shipped in from other sources, and the drying as concerning veneers cut for use at the point of manufacture. It is safe to say that the greater proportion of the waste factor in veneer work that is not covered by actual cutting can be accounted for under the head of loss through imperfect condition in the course of drying, and also during storage. This, then, is becoming an important question under the head of veneer work, and should receive as much attention and consideration as the layout of machinery and glueing plant, especially as it affects materially the success of subsequent operations whether or not the drying has been properly carried out.

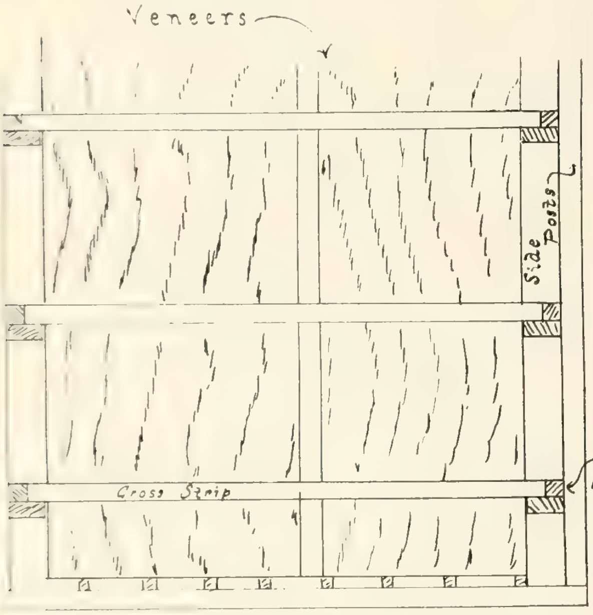


Fig. 1—Vertical cross-section of veneer drying rack

As with solid lumber proper drying is the primary consideration, although the process differs from the drying of solid wood in that a lengthy air-drying is dispensed with preparatory to kiln drying. Owing to the thinness of veneers the period of kiln drying is also shortened, since it is only a matter of care in piling that is required to obviate the warping tendencies of the veneer stock. In this article it is intended to present particularlars of a form of drying rack that has given excellent results in the drying of veneers including birch, maple, and basswood cross-banding from 1-20-in. to 3-16-in. thick. The drying room was a section of what is known as the warm end of the main dry-kiln, and the racks were built on ordinary kiln trucks so that they could be run in and out for convenience of loading and unloading. The veneers were piled with the grain running vertically, and held in place by horizontal strips fixed across the rack frame and secured at the ends in a notched strip running the full length of the rack. This strip provides a snap hold for the cross strips so that the veneers are held firmly without requiring very careful fixing in the first place. The illustrations herewith show the details of the construction of the rack.

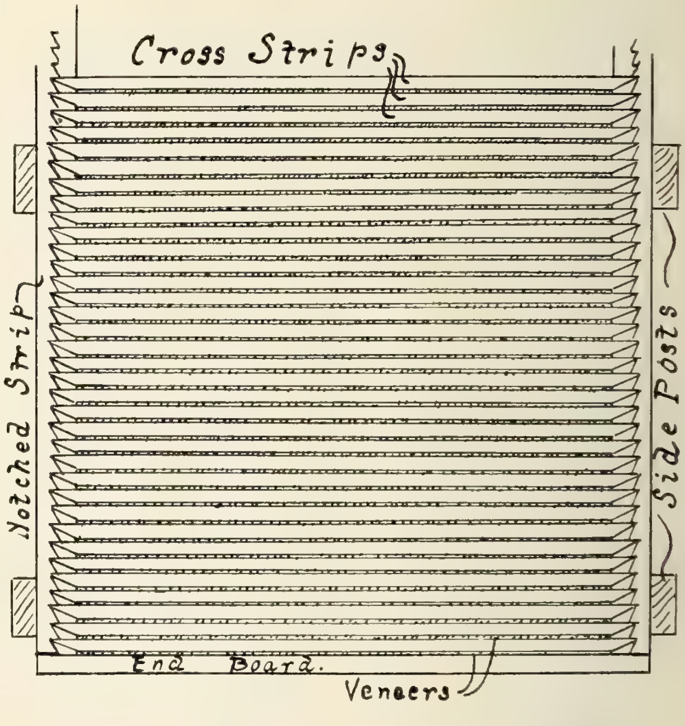


Fig. 2—Horizontal section through veneer rack

Having been placed in the rack and run into the kiln, "warm and quickly" is the keynote of the balance of the drying operation. A temperature of from 120 to 150 degrees Fahr. and a drying period of from twenty-four to forty-eight hours is usually sufficient for cross-banding of the kind of lumber and thickness already mentioned. When the temperature is below these figures longer time should be allowed to compensate for it, and in some instances the condition of the veneers may necessitate a further modification of the temperature or period, or perhaps both. The vertical piling of the veneers is necessary because their width would preclude the free circulation of air if they were laid flat. Ordinary lumber is piled flat and when space is left between the edges air will circulate freely enough for drying purposes because the spaces occur frequently enough to induce upward currents of air. With the wide sheets of veneer, however, there would be absolutely nothing to start a draft and drying would be very slow, as the efficient drying of lumber depends on the circulation of a current to evaporate and carry away the moisture contained in the wood. Without such a current the air around the wood absorbs as much water as it will hold. Then evaporation ceases for want of something to remove the moisture-laden air, and to pass more dry air over the surfaces of the wood to absorb the remainder of the water. Veneers do not, as a rule, require steam treatment in drying, because the wood is easily penetrated by the heat and is dried pretty evenly without requiring any steam before the actual dry heat is applied.

Given properly dried veneers, even the care used in that operation may be offset by negligence in storing. The room used for storage purposes should have a plain earth floor to keep the air moist enough to prevent checking, which is the chief defect that arises through poor storage methods. If the veneer is constantly exposed to dry air it will shrink, which shrinkage nearly always results in checking. Another factor is the brittleness of the material when affected by dry air. In the preparation for glueing veneer that has become brittle is difficult to handle without sustaining a certain amount of loss through broken pieces.

In submitting these remarks it is well understood that to some they will be merely a recapitulation of already well-known facts, while to others they may cover methods not so good as those they themselves have been employing. To the latter section I would say it is up to them to make known their superior methods to their brother mechanics and thereby increase the good results to be derived from those methods.

Satisfactory Practice in the Making of the Veneered Door

By Richard Newbecker in the Wood-Worker

IN the making of veneered doors there are several iron-clad rules and regulations to follow. Among these may be mentioned dry core stock, perfectly dried veneers, and good gluing. Any manufacturer that disregards any or all of these necessities will sooner or later regret ever entering this field. This means that all core stock used in the doors must be thoroughly dried before being used, all veneers dried to the greatest degree of perfection, and, last but not least, the glue room must be properly equipped for this class of work and the work in the glue room must not be slighted.

In the construction of core bodies there are several different ways or methods employed, and it may be well to illustrate some of the methods or devices used. Fig. 1 represents a core body all glued up ready to be resawed. The top and bottom pieces are hardwood, which, after being resawed along the dotted lines, will make three stiles. The size and width of the body is always determined by the core material at hand and the thickness of doors to be made. It will also be observed that many short pieces may be used in the center part of core, if of the proper width to produce the required thickness after being resawed.

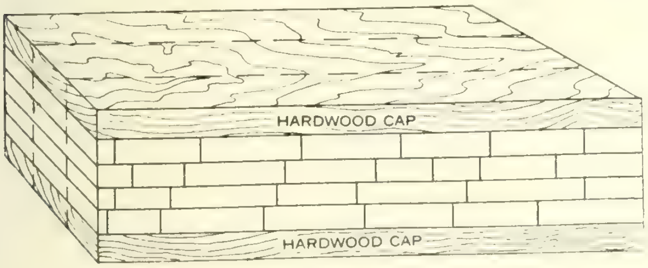


Fig. 1

Fig. 2 shows a device found quite often in plants where the cuttings or offal of sash, etc., are used in constructing doors. One progressive firm which used this kind of stock for making doors got out a number of 6 x 6-in. x 3 ft. 2-in. pieces of hardwood, then fastened some 1½ or 1¾ round iron rods, about 5 ft. long, in each end and put four of the heaviest procurable casters on same. When gluing up of core stock is started, two or three of these trucks are placed in position directly behind the glue-spreader, then a ⅛-in. thick iron caul is laid over same to provide a level surface and prevent short pieces from falling through.

When the whole width is filled up, wedges like Fig. 3 are applied between stock and rods until the desired pressure is obtained. Next a cross-brace like Fig. 4 is slipped over rods until it rests on core body. This is done to prevent rods from spreading. Then another caul is laid over this, which again gives a level surface to lay cores on, and the whole process is repeated. When press is filled it is pushed to one corner of the glue room and left standing until dry. In the meantime another press is being filled. This method does away with all unnecessary carrying of cores to press; it also removes all trouble which is encountered when this small stock is glued up in clamps of one kind or another. Often in using clamps all the stock is not held perfectly square, or a little too much pressure is applied, causing it to dish or buckle and spoiling the whole core body after glue has set.

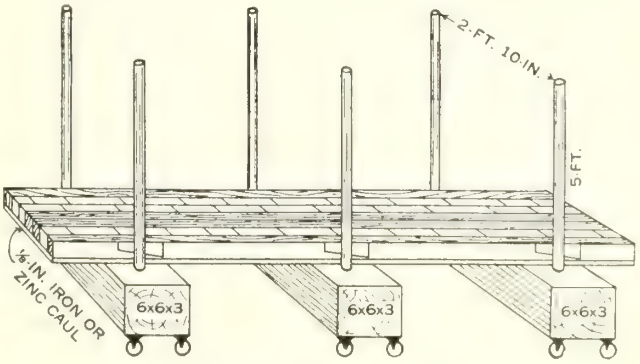


Fig. 2

Fig. 3

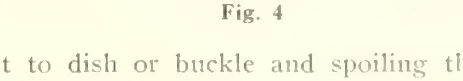


Fig. 4

The firm which uses this device has twenty-four of these foundation beams or trucks, which is ample for its output, 150 to 300 veneered doors per day. Before this concern adopted this method of gluing up two glue-spreaders and five men were kept busy gluing up cores, while under the present system one man to run glue-spreader and two men to take stock away from glue-spreader and press it up, are able to produce an equal amount of work. Sufficient cauls are always kept on hand to fill all presses. Some of them are made of ⅛-in. iron, some of zinc and some of three-ply maple. All are of sufficient width to just fit in between the upright iron rods.

In core construction there are several different methods employed, a few of which are illustrated herewith. Fig. 5 represents a style of core body which some of the smaller producers employ in getting out odd-sized doors. Before this core is glued up it must all be matched as shown. Probably most of this is done on the molder or matcher, but in one place I saw it grooved on the jointer.

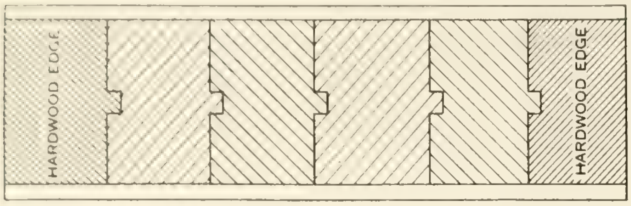


Fig. 5

Fig. 6 shows a type of core construction which, in the early history of veneered doors, one progressive eastern concern used. This firm had an almost exclusive export trade in these doors, and special machines were built for the rifting of veneers and core bodies

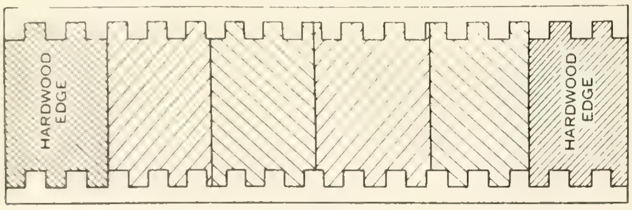


Fig. 6

The producer of this type of door claimed that even if no glue was used in gluing the veneers to cores, it would still be impossible to separate them, owing to the method used in welding and pressing the core body and veneer together. No thinner veneer than ¼-in. was used, which, of course, would be alternately ⅛ and ¼-in. thick after it was rifted. This door was also claimed to be proof against blistering and loosening up of veneer. The manufacture of this type, however, was so expensive that after several years this concern discontinued making it.

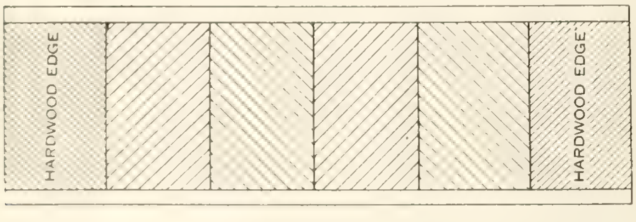


Fig. 7

Fig. 7 represents the common construction of veneered door, of which a goodly number are made. While this is a simple glue-jointed core body, it has always given very satisfactory results. Fig. 8 shows the dovetail type of core construction which several of the larger manufacturers have adopted, and which, according to all reports, fulfills all the claims made for it. However, ta manufacture this type of core an automatic glue-jointer must be employed, which machine has of late become popular in this line.

At present ⅛-in. veneers are used almost exclusively for the interior, while ¼-in. mostly go for exterior doors. It is true that there are still some veneered doors made with cross-banding and 1/16-in. thick face veneer, but the amount is so small that as a whole it hardly needs mention.

It will be noted from the illustrations that all core bodies have two hardwood edges. This is a method recently adopted by several manufacturers—to so construct the cores, whether they are solid stuck molding or hand-molded doors. By having a hardwood edge all around on outside the moisture cannot penetrate to the inside as readily as if it were a soft, porous wood like pine. Especially is this true of the top rail and bottom edge of bottom rail.

The claim has been made from time to time that the veneered door for exterior use is a failure and not weather-proof. This, however, is an absurd claim. The manufacturers have made much progress and are producing a door that is as near weather-proof as it is possible to make. The meaning of a weather-proof door must, however, not be misunderstood, as the manufacturers do not intend to produce a door that can be soaked in water. A solid door does not stand long if given such treatment, so why should it be expected from the veneered product?

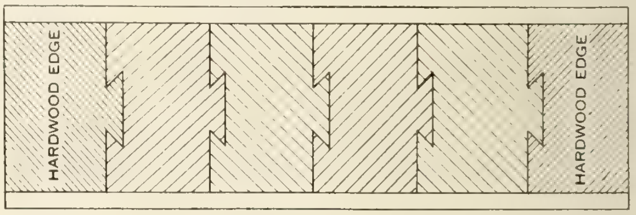


Fig. 8

Some manufacturers have a great deal of trouble in trying to get their customers to use proper precaution with veneered doors in freshly-plastered buildings and the like. Many a producer has been blamed for bad work, where it was entirely the customer's carelessness that caused loosening up of veneers. To overcome this trouble one manufacturer will not send out a door until a tag or ticket something like the following is attached to each door or crate of doors:

Don't hang doors in freshly-plastered buildings; don't store doors in exposed places, in moist buildings or damp cellars; don't neglect to fill edges of door with good filler, varnish or paint; don't forget to treat these doors the same as high-grade furniture. They were made just as painstakingly. Don't forget these doors have been thoroughly inspected, stand the test and are first-class in every respect.

This manufacturer says that he has had hardly any trouble on this account since putting the above plan in use, and intends to stick to it as long as he makes doors.

The Utilization of Veneer Waste

THE best place to utilize all the waste possible incident to veneer making and veneer using is right in the veneer industry itself, by making the product up more completely. Moreover, there is hardly another place where that old proverb of the ounce of prevention being better than a pound of cure will apply more fittingly than in the veneer industry. In other words, the best way to

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

Hoffman Bros. Co.

Reg U S Pat. Off. Reg U S Pat. Off

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods
ANY THICKNESS.
1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—SPECIALTY—

Indiana Quartered Oak

Reg U S Pat. Off Reg U S Pat. Off

Sawed Quartered Oak Veneers

WHITE OR RED — HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

save or utilize veneer waste and realize from it is to make less of it. Reduce it at the source, get more out of the timber in the way of veneer originally and then handle it so as to get more of the veneer product into real service and have less of it going to trimming. This is easier said than done, but it is not impossible to do to quite an extent at least. It is really easier and much more practical to take the steps and precautions necessary for reducing the quantity of waste than it is to devise other ways and means for utilizing waste after it is made, and converting it to some good purpose.

Both figures and ideas vary considerably as to the amount of veneer waste, or rather the entire quantity of waste between the log and the available veneer product, and between the available veneer product and the finished veneer article. Perhaps the general average will be something like 33 1/3 per cent. of waste in converting blocks into veneer, and then about 33 1/3 per cent. of waste in this available veneer product when it comes to working it up and utilizing it for face veneer or in the making of built-up lumber.

This is merely suggested as a possible tentative average to get at some basis for a line of argument and deduction on the subject of saving waste by preventing it.

One set of tabulated figures in the hands of the writer at present, taken from a rotary veneer cutting plant in operation, shows logs used during a day's run to the total of 45,000 feet, and an available veneer product of 30,000 feet. This would be a waste of 1/3 as compared to the original log scale, but if figured in comparison with the final veneer product, the waste pile is equal to half the amount of available veneer.

The waste in this instance is figured on the basis of board measure feet in logs as a starting point. Then the thickness of veneer is multiplied to get the inch thickness of boards. For example, ¼ of an inch thick requires four times the quantity surface measure to make 1,000 feet board measure.

This waste becomes even more startling when it is considered that the board measure scale is calculated to allow something like 25 per cent. of waste—that is, it allows for the sawdust and slabs, which originally amounted to approximately 25 per cent. Compared to the solid contents of a log, there would be in this case a waste of the original 25 per cent. allowance in the log scale and of 33 1/3 per cent. that shows between the board measure log scale and the available veneer product. Adding to this a final waste in the using of veneer of 33 1/3 per cent., the waste item begins to assume almost staggering proportions.

Preventive Measures and Marketing as a Remedy

The thing to do is to face this waste in its full measure and then before seeking ways and means to market it advantageously, see how much of it can be prevented by proper manipulation.

The first question in a proposition of this kind is, what makes the waste, how does it come in? The veneer machine presumably makes no kerf, that is, no sawdust; consequently it should turn out a measure practically equal to the full solid contents of the block. It is easy, however, to see that it doesn't. Figures of different mills at different times may vary materially in the totals and the percentage of waste, but all of them, all the time, show that there is a waste, that notwithstanding the allowance for sawdust in log scale measurements, the veneer product will never measure up to the board measure scale of the logs.

The investigation as to what causes this loss shows at least four different channels. The first and most noticeable one is the cores left in the veneer machine. The second on the list is end waste, the extra length of block allowed in cutting to length for trimming the veneer sheets to uniform dimensions. Third, we have waste incident to rounding up blocks and getting them to a shape where they will produce a thin continuous sheet of veneer. The fourth channel is that of defects developed in timber in the process of cutting and of stock damaged from one cause or another while cutting.

Taking these in the order mentioned, we have first the matter of cores. The cores or center pieces left in the rotary veneer machine ordinarily vary in size from six to ten inches. Perhaps eight inches would be an average, though much depends upon the nature of the timber and the length of the blocks being cut and the size of the machines and chucks in use.

Down in Florida where lots of pine is worked into orange box stock and light package material, small machines are used working on short blocks, and the pieces seem to vary in size from four to six inches. Large cores are very rarely seen in places of this kind. Turn from that, however, to a veneer plant cutting door stock and other large dimensions in veneer and one may find lots of cores nine and ten inches in diameter, sometimes as large as twelve inches. This is because it takes heavy machines and large chucks to hold the blocks and cut this class of veneer.

There is a way to save some of this core waste, and the veneer manufacturing trade is beginning to turn more attention to it. The simplest, and so far the most practical proposition for saving in the core waste, is to use some smaller machines for rehandling the cores and getting as much good veneer out of them as practical.

The way this matter is handled at one progressive plant in the South is to take the cores immediately from the big machines to a smaller machine and work them down while they are still warm. If the big machine is cutting short blocks, the core may go immediately from one machine to the other. If the blocks of the big machine are too long to go into the small one, or if the ends have been battered up with the chucks, the ends are trimmed off to solid wood, making the block somewhat shorter. If the blocks from the big machines are of extra long length they are cut into two short blocks, then swung into the small machine and worked down to a very small core. A big swing cross-cut saw serves to do the end trimming and the cutting of the blocks in two when necessary, and with this arrangement quite a lot more of the available veneer product is obtained than would be practical without it. Occasionally in the working of a sound log that is small originally, the little machine may get practically as much good veneer from the core as was secured primarily from the block by cutting on the big machine. Indeed there are many instances where the small machines get some excellent product from the cores. In other cases the product from the cores will not make a good face veneer—it makes fillers and backs and can be utilized to better advantage than it is possible to utilize the core in any other way. There has been enough experimenting along this line to remonstrate that it is quite practical to materially reduce the core waste in veneer making by the use of small machines for handling the

(Continued on page 52)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1 16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1 20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum.
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

WRITE US FOR PRICES

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

Producers and Manufacturers

MAHOGANY Mexican, Cuba, African

CIRCASSIAN WALNUT
(Poti Wood)

East India Mahogany (Andaman Islands)

San Domingo (Direct Importation)

All Imported Woods in

LUMBER and VENEERS

Request our District Salesman to call upon you with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,

Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - **Ohio**

We have here in Chicago the most modern and best equipped Veneer and Band Saw Mill in America

The first order will make you our permanent customer—Because:—

We manufacture right, so—
Our product is right.
We carry a large stock, so—
Our shipments are right.
We have a labor saving mill, so—
Our prices are right.

We Specialize in Oak and Mahogany Veneers, sawed and sliced. Also Quartered Oak and Mahogany Lumber

Let us know your wants

Fred W. Black Lumber Co.

2245 So. Crawford Ave., CHICAGO, U.S.A.

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for

Poplar and Red Gum Veneers and Crossbanding

CIRCASSIAN WALNUT VENEER

Lot No. 1, 9 flitches, 16000-ft., average value 4 cts. per foot.
Lot No. 2, 13 flitches, 23100-ft, average value 2 cts. per foot.

A DISCOUNT OF THIRTY PER CENT

Offered First Cash Buyer.

HUDDLESTON-MARSH LUMBER CO., 2260 Lumber Street
CHICAGO, ILL.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS
American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:
BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM
Quartered

3 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
3 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

RED GUM
Plain

4 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
1 " 10/4 "
2 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

THE FAMOUS CACHE RIVER GUM
Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

Cincinnati Veneer Co.

Manufacturers of

Veneers

and thin lumber in all thicknesses

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments.

Stock all well manufactured from selected logs and roller dried.

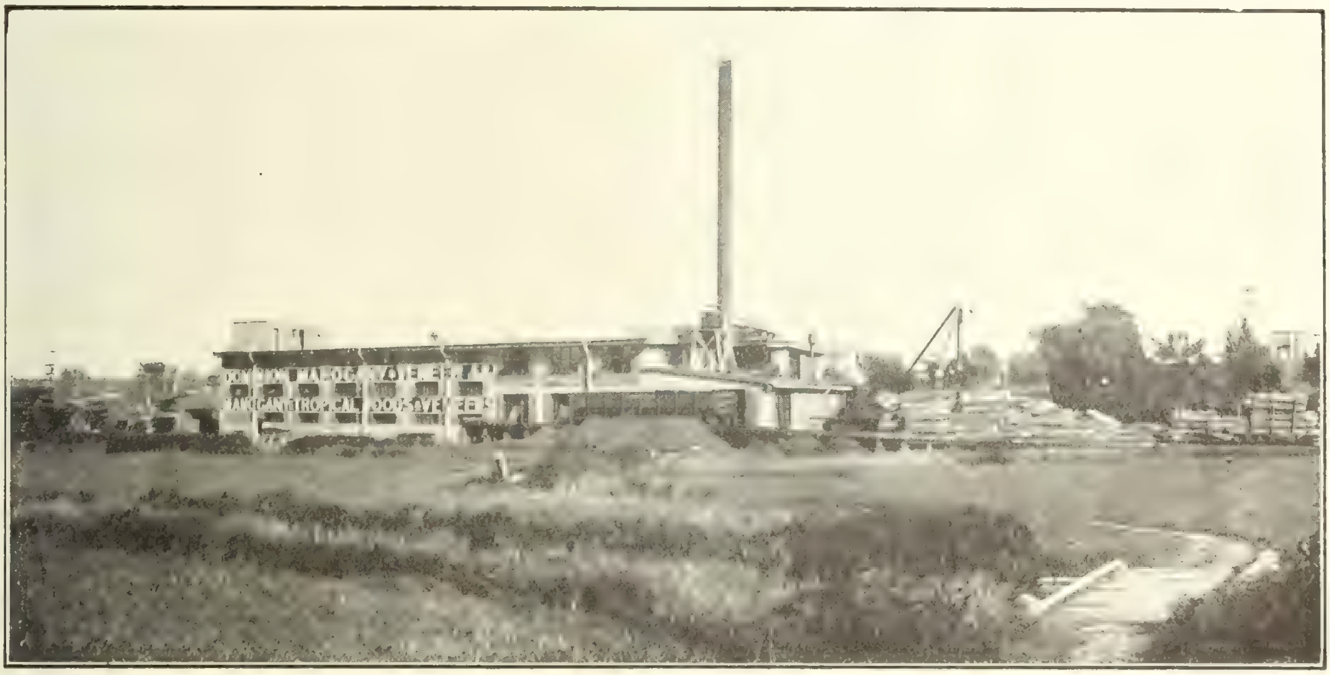
Cincinnati -:- Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

The Dominion Mahogany & Veneer Co.
Limited



The Pioneer Mahogany Mill of Canada

LUMBER— African, Mexican, Cuban Mahogany, English Oak, Teak, Black Bean and Vermillion.

VENEERS—Sawed, African and Mexican and Cuban Mahogany, Maple, English Oak, American Quartered and Plain Oak 1/20″-1/4″.
Sliced, African and Mexican Mahogany, Circassian Walnut, Italian Walnut, Birch, etc. 1/24″, 1/20″, 1/16″.

ROTARY CUT— Birch, Maple, Ash, Gum, Poplar 1/24″-1/4″.
Drawer Bottoms and Pin Block Veneers and Door Stock.

MADE IN CANADA

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

Dominion Mahogany & Veneer Co., Limited
MONTREAL WEST, QUE.

(The Utilization of Veneer Waste)
continued.

continued.

light blocks and for handling the heavy cores from the larger machines.

End waste comes from the allowance made in the length of veneer blocks for trimming. It is pretty much the same allowance that is made in cutting saw-logs, with the difference that if is made oftener because the average veneer block is only about ¼ the length of the average saw-log. The end allowance is practically the same so that in working up timber into veneer blocks there is four times the waste in end trimming that there is in the sawmill for trimming purposes.

Two general plans suggest themselves for closer utilization there. One is to take more pains in the work of cutting logs into blocks and reduce this allowance for end waste by closer manipulation. The other idea which suggests itself is to dispense with the core knives used for trimming the ends of veneer sheets which will permit using shorter blocks, and do the end trimming with saws after the veneer stock is dried. It ought to be practical, by a little exertion along the line of closer utilization, to materially reduce the amount of this end waste.

Some waste incident to rounding up a log or block in the veneer machine, or slab waste as we might term it, can be eliminated in many plants by the exercise of more care in centering blocks. Where blocks are carelessly centered in the machines there is an unnecessary amount of this slab waste. Where they are carefully centered and the waste is heavy because the block is not round originally we have a form of waste that is practically unavoidable. It may be practical in many instances to save this and work it into dimension veneer and utilize in the veneer work itself quite a lot that ordinarily goes into the wood pile.

The waste incident to defects in the block and in cutting is a waste that depends partly on the skill of the operator and the condition of the machine and partly on the nature of the timber being worked. Given a good sound block and machine in good condition with a sharp knife, there should be very little waste incident to damage in cutting. Perhaps the heaviest waste in cutting comes from blocks splitting before they are worked down. This may be checked a little by careful handling. The general proposition of reducing waste under this head involves the use of good machinery operated only by skilled, competent men supervised by a foreman who will insist upon the machines doing their work right and getting as much good stock as possible out of every block.

Part of it is a matter of selection and of fitting veneer to the work and part of it is a matter of closer manipulation just as in the case of the end waste and the core waste. In trimming veneer and in making up panels allowances are made for end trimming and for side trimming, for cutting to exact size, and sometimes allowances are made with such a liberal hand that they unnecessarily increase the waste. More care in the work and closer manipulation will reduce this materially, and thoughtfulness and care in cutting and trimming veneer will make it practical to use a fair percentage of trimmings from one job on another and thus utilize material that otherwise goes to waste.

So both in the making and in the using of veneer there are many opportunities to use up the product closer and reduce the item of waste, and after all is said, this is the best utilization that can be devised for veneer waste, and it holds generally for wastes of all classes and kinds.—Hardwood Record.

The Upkeep of Veneer Knives

Somebody, at some time or other, created and developed popular favor for the idea that it is difference of opinion that makes horse races. Differences of opinion make other things, too, and among them different practices in the way of maintaining or keeping up the knives of veneer machines. Cutting knives are used two ways in veneer machines: they are used stationary, with the stock revolving against them, in the rotary machine, and they are used for slicing. Sometimes a knife remains stationary and the flitch travels, and at other times the knife carriage travels and the flitches remain stationary.

There are to be found some remarkable extremes in the use and the upkeep of knives. For example, you may go into a plant where they are cutting fine figured wood into face veneer and you will see the expert cutter watching the surface of his flitch or block like a hawk, and the minute any roughness appears he stops his machine and whets his knife. In other words, he may do whetting several times in the process of working up one log or flitch, and certainly he uses a whetstone quite a lot in the course of a day. The other extreme is represented by the rotary veneer man cutting box shooks and plain veneer, who never uses a whetstone, and figures on grinding his knives about once a week, unless some accident happens to make the grinding necessary sooner.

There are men who would not think of putting a knife in a rotary veneer machine and starting it to work cutting veneer without whetting it at least enough to take the wire edge off. Usually the peeler boss has quite a collection of whetstones, which he keeps in excellent shape, so that they will cut freely, probably standing immersed in a bucket or can filled with coal oil. He whets his knives to a keen edge when he brings them from the grinder, and after he puts a knife in the machine he depends upon the whetstone to keep it in order and good shape until it has worn to the point where it is necessary to go back to the grinder again.

While this is, perhaps, the usual thing, there are good veneer men who take an entirely different view, men who seldom use a whetstone. One successful veneer cutter talked to recently on this subject said that he never used a whetstone if he could keep from it.

To the man familiar with veneer cutting it will go without saying that the man who neglects the use of the whetstone is cutting nothing but box shook lumber or plain veneer, where smooth cutting is not as important as the cutting of face stock or real good cross-banding. The stock this man was making, though, was fairly smooth for this class of stock and his veneer machines gave very little trouble. Usually the knives would run nearly a week, or perhaps average a week's run, unless an accident happened to them.

A man who would cut that class of veneer known as fine veneer or face veneer and high-grade cross-banding must use the whetstone, and perhaps the fact that he must use it and does so makes necessary the frequent use of it, because when a knife is once whetted it must be kept whetted sharp and smooth. On the other hand, it may be that the man who is cutting shooks or plain veneer increases his own work and reduces the efficiency of his knife and machine by using the whetstone.—Veneers.

For Sale

One Continuous Feed Glue Jointer, in good order. Price $300. Can be seen in operation at J. H. Connor & Son, Limited, Ottawa. 5

For Sale

One Table Leg Machine, also one Dado Machine, well equipped, and in first-class condition. Apply to

THE M. F. BEACH COMPANY,
3-4-5 Winchester, Ont.

For Sale

One No. 3 Nash handle Sander; will take stock as short as 14 in. This machine is in good order, and will be sold at a bargain. Apply to The North American Bent Chair Company, Limited, Owen Sound. 5

For Sale

White Plain Sawn Oak Lumber: 1 car dry 2½-in. First and Seconds and Number One Common—very wide run; also 1 car 3-inch Ohio stock—not surface checked. Also 4 x 4 in., 8 to 16 ft. dry Oak. Charles F. Shiels & Company, Cincinnati, Ohio, U. S. A. 5-6

For Sale

Woodworking shop fitted especially for general work, such as interior trim, store and office fixtures, sash, doors, etc. New and up-to-date machinery recently installed. Blower system. First-class dry kiln. Railway siding. Situated in a thriving Ontario town. Owners well and favorably known to the trade and are doing a splendid business.

This is an exceptional opportunity to buy a bright business already established.

Apply to X Y Z,
x5-6 C/o Canadian Woodworker, Toronto.

Box Machinery Bargain

One Dovetail Machine.
One Setting Up Machine.
One Four Saw Trimmer—Self Feeding, made by Dovetail Machine Company, St. Paul, Minn.
One No. 22 Box Trimmer, made by Fischer Machine Works, Chicago, Ill.
All cost $3,300—Will sell for $1,000.

Inquire THE GLOBE SOAP COMPANY,
3-4-5 Cincinnati, Ohio.

Positions Vacant

Wanted

Live, energetic hardwood salesman, familiar with the trade, for the provinces of Ontario and Quebec. Address Box 35, Canadian Woodworker. 5

Positions Wanted

Employment Wanted

Position wanted as Superintendent or general foreman, experienced in interior house work, bank, store and office fixtures, estimator and draftsman. Furnish references. Box 34, Canadian Woodworker, Toronto. 5-6

Situation Wanted

Fumed Oak Finisher wants position in good factory. Good on colors, an all round shader and finisher fuming box or otherwise. 15 years' experience. Yearly engagement preferred. Apply Box 33, Canadian Woodworker, Toronto. 4-5

British Columbia Timber, Limited, 125,000,000 feet, principally Fir, well watered, on improved river, very close to tide-water. Cruised by owner who guarantees quantity. Price $1.00 per thousand. Write to-day. J. W. Ney, 419 Pender West, Vancouver, B.C. F

Large American manufacturer of veneers and thin lumber wants a representative to travel Ontario and Quebec on a commission basis. Exclusive territory. Apply Box 32, Canadian Woodworker. F

Stock Panels

We carry in our shipping room at all times a large assortment of stock panels, mostly 3-ply, ¼ inch thick, in **Plain Oak, Quarter Sawed Oak, Mahogany, Birch and Maple,** both one and two good sides from which we *can ship same day order is received.*

Veneer panel making is our specialty, and we claim that the panels we make are cheaper in the long run for they

Will not come to pieces after they are in the furniture

Do you see the point?

Send us your orders, or ask for Stock List

If we do not have on hand what you want, can build and ship promptly anything in 3 or 5-ply.

The
Gorham Brothers Company
Mt. Pleasant, Mich.

PATENTS

Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% **PROFIT SHARING**

Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

PATENTS

STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) TORONTO, CAN.
The business of Manufacturers and Inventors who wish their Patents systematically taken care of is particularly solicited

The Hardwood Market

NO important changes have taken place in the hardwood trade in the last few weeks. The market for hardwood has been depressed to some extent by the fact that manufacturers are using up their supplies rather than adding to their stocks, with the apparent intent of getting them as low as possible before embarking upon fresh orders. In our review last month we referred to the fact that many furniture factories had begun to consume large quantities of hardwoods and that a fair business was being done with box manufacturers. The fact remains, however, that the supplies remaining over in most factories have sufficed for present requirements, consequently very little in the way of substantial orders have materialized as yet. There is a good movement in the lower grades of cottonwood and gum. Oak is selling fairly well and there is a firm movement of ash, chestnut and poplar. Prospects for an early revival of trade are not at all bright. While there is a fair amount of trade in progress in large centres, it is yet far short of the usual volume at this period of the year. In the opinion of the Southern Lumberman there is little change, so far as the several woods are concerned, from conditions prevailing for several weeks past. The relative demand is about the same, though the general movement is somewhat more brisk and prices perceptibly firmer. Prominent dealers in hardwoods, while optimistic concerning the future, are not by any means encouraged by the present quiet, not to say stagnant condition of the market. "The hardwood condition in most sections continues inactive with a liberal sprinkling of orders which, however, in the most part result in a considerable accumulation," says the Hardwood Record. Reviewing the situation at greater length the same paper has this to say:—"For the most part in the large cities building has not been so satisfactory as had been anticipated, and as a result the yardmen are not putting in any great quantities of stock. Factory trade is continuing its policy of short time buying and small orders, which is probably the result both of unsatisfactory conditions in their own trade and the belief in the possibility of hardwood prices breaking. It is safe to predict that they will be disappointed in the latter assumption. Prices hold firm. All available lumber for flooring by the rail shippers will be at last year's figures or better. The flooring business is in good condition and the manufacturer is feeling able to pay the prices which prevailed last year. A number of jobbers' yard stocks have been discontinued and there are comparatively few stocks in the hands of middlemen which the consumers can draw upon for rough lumber. Woodworking factories are running and depleting their reserves which will necessitate buying additional stock. Summarizing, the general situation continues to be slow but sound, with conservatism the keynote and with the probability that present conditions will maintain for several months to come."

On the whole traders appear to be uncertain about developments in the immediate future, but at the same time they are hoping for an early improvement in the present inactive conditions.

Southern Hardwood and Veneer Market

Correspondence of the Canadian Woodworker

Louisville, Ky, May 18: The hardwood lumber market remains quiet, not to say stagnant. Demand is not at all lively, though the sum total of the movement is not so far below normal as a casual inquiry would indicate. The fact of the matter is that furniture manufacturers and other large users of cabinet materials seem to have lost confidence in the business situation, and until they regain it they are hugging the shore and buying just as little as possible. The ship of business, at least in the woodworking lines, is moving along under reefed sails; and while there is an entire absence of stormy conditions, this conservative policy seems to be endorsed by a large number of important manufacturers. The market for hardwoods and thin lumber, as well as built-up stock, has been depressed to some extent by the fact that manufacturers are not replenishing their stocks but are cutting into their supplies, apparently intent on getting them as low as possible before re-ordering. Thus the amount of business being done in hardwoods is less, in proportion, than the amount being handled by consuming factories. Until the reserves are consumed and the manufacturer finds himself up against the stark necessity of having material, trade with the hardwood men is pretty certain to remain dull.

This period of using up reserve stocks is not likely to be very extended, however, in view of the fact that the tendency during the past several years has been very marked in the direction of carrying light stocks. In other words, the concern which thought it necessary eight or ten years ago to have several million feet on its yard is now doing business with a few hundred thousand feet in stock. Some houses, whose necessities are not so large, are buying carefully enough to have cars unloaded direct into the kiln, the lumber being trucked into the factory and consumed without going on the yard. It is not every plant that can adjust supply and consumption so nicely; but where this is the case the concern undoubtedly enjoys quite an advantage in eliminating handling charges, as well as reducing its investment in material. In view of the fact, however, that factory men have not been in the habit of carrying large stocks, the tendency to cut down cannot affect things as greatly as this policy did, say, in 1908. In other words, consumers will come to the end of their rope more quickly. Consequently, though trade has fallen off, and is not by any means up to last year's level, the general impression is that the demand will necessarily improve in the near future.

Prices seem to have touched rock bottom. Plain oak, which has suffered most from poor demand, and has shown a slump in price, is holding about steady at quotations which have been in evidence for the past sixty days. Quartered oak is firm, and the demand is better, relatively, than for most other woods. Chestnut has been moving satisfactorily most of the winter. Sound wormy particularly has been in good call, though the demand is now falling off to some extent on account of the fact that the panel plants, which continued to run actively until recently, are now finding

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

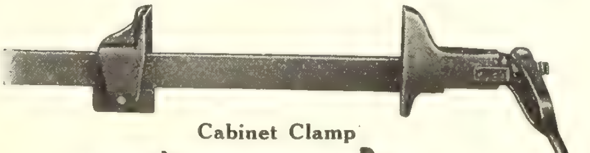
CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

Car Bunks
OF
"ANDREWS"
MAKE

Are different.
Are smooth running.
Are better constructed.
Are cheaper in the long run.
—Than Any Other Make.

Supplied in all Sizes by
The
A. H. Andrews Co.
115-117 S. Wabash Ave.
CHICAGO

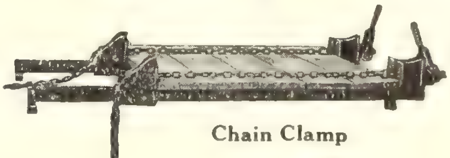
"Pioneer" Moulding Sander
Power Veneer Presses



Cabinet Clamp

Veneer Press

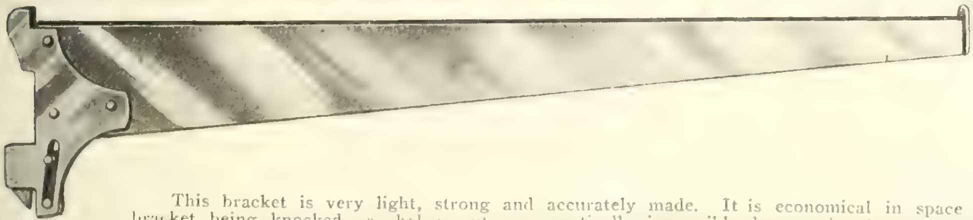
Write for
Catalogue
and Prices



Chain Clamp

Black Bros.
Machinery Co.
Mendota, Ill.

Column Clamp



ADJUSTABLE
BRACKETS

This bracket is very light, strong and accurately made. It is economical in space and beautifully finished. Accidents from bracket being knocked or shaken out are practically impossible due to the Automatic Locking Device. Send for catalogue describing this and many other specialties in Hardware for Store Fixtures and Show Case manufacturers.

The Reflector & Hardware Specialty Mfg. Co.
Western Ave. and Twenty-Second St. - - - CHICAGO, ILL.

opportunity to operate about half time only. Poplar has shown some signs of revival. Here is a wood which has had a rough voyage of it for several years, with the loss of trade in the automobile business, but general vehicle and building lines are taking a good percentage of the production, while poplar is one of the most adaptable woods in existence for use in veneering. It is a soft wood, works well, is light and takes the glue in splendid style. While basswood, birch and gum all have their friends in the glue-room, advocates of poplar for cross-banding and core stock purposes generally are numerous. Poplar timber is reported to be commanding a higher price than ever this season, so that there is much chance of a slump in prices for poplar veneers or lumber. The suggestion has been made that the bumper crop of winter wheat which is now expected, and excellent prospects for other crops, will almost surely stimulate business by the middle of summer, and that consumers would make no mistake by going ahead at a nominal rate, putting excess production over current sales into storage. It is contended that this additional stock will come in handy when the rush of business develops as it is expected to do. The suggestion sounds logical, but is tinged, of course, with self-interest on the part of the supply houses. The only way to determine the proposition is to study the situation and decide, each for himself, whether prospects warrant putting finished goods in stock.

At all events, however, the lumber market at present is favorable to the buyer, and while no general reductions have been noted, a good buyer can usually secure substantial concessions for stock for immediate delivery. It is probably a good plan to "shop" a little bit just to feel out the market and discover which way the wind is blowing. From the writer's point of view, however, it doesn't seem that the consumer can go far wrong in stocking up now, if he is in a position to make use of the material.

Trade Happenings and Opportunities

Woodworking News from Coast to Coast

Messrs. Zinger & Honsinger, furniture and harness dealers, Durban, Man., have dissolved partnership.

The handle factory of Mr. Ira Webster was burned down on May 4 at Rutherford, Ont.

Messrs. Zacks Bros. have opened a furniture and house furnishing store at Peterboro, Ont.

Mr. Arthur Rouleau, furniture dealer, Plantagenet, Ont., died recently.

The Federal Match Company, Limited, has been incorporated at Calgary, Alta., with a capital of $150,000.

At Havelock, Ont., Messrs. Puffer Bros., of Norwood, have started a furniture and undertaking business.

Mr. Alex. Galbraith has taken over the sash and door factory of McClellan & Balfour, at Edmonton, Alta.

Mr. Benjamin Orr, a well-known boat-builder and resident of Humber Bay, Toronto, died on May 1, aged 52.

The Cooking Lake Row Boat Company, Limited, has been incorporated with head office at Edmonton, Alta.

R. W. Burnaby, 1844 Yonge Street, Toronto, has purchased a site at Davisville for the erection of a planing mill.

The Northern Casket Company, Limited, is incorporated with head office at Calgary, Alta., with a capital stock of $100,000.

At East Burnaby, B.C., the Brooks Sash & Door factory has resumed operations after being closed down for several weeks.

The South America Cabinet Woods, Limited, has been incorporated to carry on the timber and sawmill business at Toronto, Ont.

At Galt, Ont., Mr. J. Anderson has disposed of his furniture store and business to Mr. W. Allen, late of T. Lytle & Son, also of Galt.

At Wiarton, Ont., Mr. T. J. Moore is erecting a sawmill in view of the contemplated transference of his Novelty works from Oliphant, Ont.

The Western Cooperage, Limited, was incorporated recently. The new company has a capital of $100,000, and the head office is at Calgary, Alta.

Planing machinery valued at $3,000 was destroyed in a fire which burned down the planing mill of Messrs. Esdale & Douglas, Ottawa, on May 1.

At London, Ont., recently, the plant of the Rice Cigar Box Factory was completely burned out, the damage to plant and stock being estimated at $25,000.

The Christie Woodworking Company's plant at St. John, N.B., has been destroyed by fire at a loss of about $40,000.

"Wood's Saws are Good Saws"

Fred Wood & Son

SAWS

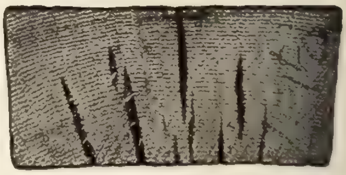
135 Richmond St. West,
TORONTO

We specialize in the manufacture and repairing of fine Circular Saws for the use of Planing Mills and Woodworking Plants.

Every kind and form of

DRYING LUMBER

Grand Rapids Dry Kiln



QUALITY DRYING

Grand Rapids
Mich. - U. S. A.

TIMMS, PHILLIPS & CO.
VANCOUVER, B.C. Limited

Write us for attractive prices on

Clear Douglas Fir
Clear Red Cedar
Clear Spruce

Also X X X Red Cedar Shingles

Canadian
Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer
603 Eastern Townships Bank Building
MONTREAL

The Atlantic Lumber Co.

Manufacturers and
Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers
Phone Main 6386 - TORONTO

HOME OFFICE, BOSTON, MASS.
Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Well Manufactured Lumber

And Standard Grades appeal to all careful buyers.

A few items of such we offer here in thoroughly dry

3 car	4/4	No. 2	Com. and Bet.	Soft Maple
2 "	6/4	No. 2	"	
1 "	12/4	No. 1	"	
3 car	6/4	No. 2	Com. and Bet.	Soft Elm
2 "	8/4	No. 1	"	
2 "	12/4	No. 1	"	

Inside of 60 days we will be shipping from our New Stocks of ASH, BASSWOOD, BIRCH, ELM and MAPLE, and are ready to book orders for future shipments.

Steven & Jarvis Lumber Co.
Eau Claire, Wisconsin

B. C. Fir Timbers
and
Clear Finish Stock
Kiln Dried or Air Dried
Red Cedar Shingles
Write or Wire

W. G. Scrim Lumber Co.
Vancouver, B.C.

Plain Sawed Oak

Mills in West Virginia and Kentucky

Wilcox & Knapp
Conneautville, Pa.
Quotations Cheerfully Furnished

Buy Direct
From the Manufacturer
We are their Salesmen

The
Saw Mill Owners
Sales Co.
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston, New York, Watertown, Montreal, Quebec, Toronto

Ash
B.C. Doors
Birch
Basswood
Beech
Cherry
Cedar
Chestnut
Cottonwood
Elm
Fir Finish
Hickory
Hemlock
Maple
N.C. Pine
Oak
Poplar
Red Gum
Red Pine
Sap Gum
Spruce
Sycamore
Shingles
Tamarac
Timbers
Walnut
White Pine
Yellow Pine

We Solicit Your Inquiries

The insurance is $20,000. Dr. W. A. Christie, 55 Waterloo Street, St. John, is the president of the company, and Jas. Christie is manager.

The Speer-Walton Furniture Company, Limited, was incorporated recently as cabinet makers, joiners, upholsterers, etc., with a chief office at Victoria, B.C.

The Nagrella Manufacturing Company, Limited (manufacturers of kitchen cabinets, etc.), have sustained loss by fire at their plant. The value is unstated.

The London & Petrolia Barrel Company of London, Ont., which was incorporated recently, will enlarge its plant each year. An addition will be erected this season.

Operations have been commenced on an addition to the planing mill of Messrs. McAuliffe-Davis Lumber Company. Woodworking machinery is scheduled for installation.

The erection of a circular saw mill at Green's Siding, Ont., for Messrs. Haight & Dickson Lumber Company, Sudbury, is scheduled for completion by the end of May.

At Hamilton, Ont., the planing factory until recently owned by Mr. W. H. Stickney, has been acquired by Messrs. Bailie & Peace. The new firm intends handling all kinds of woodwork.

The McEachren Tie & Timber Company, Limited, has been incorporated with a capital of $40,000 to carry on the timber and sawmill business, the head office being at Thessalon, Ont.

The James Brookes Woodworking Company, Limited, whose head office is at East Burnaby, B.C., has been incorporated with a capital of $15,000 to conduct a timber and sawmill business.

The Forests Products Company, Limited, has been incorporated with head office at Vancouver, B.C., for the manufacture of lumber, shingles, sash and doors. The company has a capital of $100,000.

The ratepayers of Waterloo, Ont., have carried a by-law in favor of a loan of $50,000 to the Globe Furniture Company, who contemplate the erection of two additions to their plant at a cost of $125,000.

The box factory of the Turner Lumber & Pulp Wood Company, at Limoilou, Que., has been damaged by fire to the extent of $20,000. The loss is covered by insurance. The owners will rebuild and will require machinery.

The Simpson Planing Mill Company, Limited, has been formed at Trenton, Ont., to continue the business of the Simpson Planing Mill Company. The provisional directors are Messrs. Alexander Rhind, John McGee, Charles W. Wills, Edgerton J. Cluskey, and Harold B. Duthie.

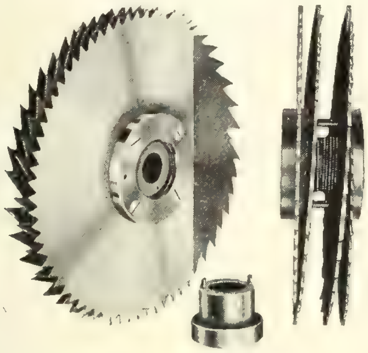
Work is started on a large addition to be made to the Berlin Interior Hardwood Company's plant at Berlin, Ont. The new building, which will be 50 ft. by 160 ft., and five storeys high, is to be of red pressed brick. It will be used for the company's offices, shipping and store rooms.

Mr. Wm. Willer, who is well known amongst dealers and sawmill men in Canada and the United States, has joined the executive staff of the Simonds Manufacturing Company, manufacturers of saws, knives, files, etc., at Fitchburg, Mass. Mr. Miller has had 37 years' experience in the sawmill business.

The bed manufacturing business, carried on by the Shurley-Dietrich Company, Limited, of Galt, Ont., whose plant was burned down a short time ago, has been taken over by the Maple Leaf Bedding Company, Limited. A site has been selected for a factory at a cost of $30,000, $12,000 of which is asked as a loan from the town of Galt. The heads of the new company include Mr. J. C. Dietrich, Galt (President); Mr. C. C. Osborne, Toronto (Vice-President); and Mr. Roy Torrance, Galt (Treasurer and Managing Director).

Trade **FOX** Mark

ADJUSTABLE



DADO HEADS

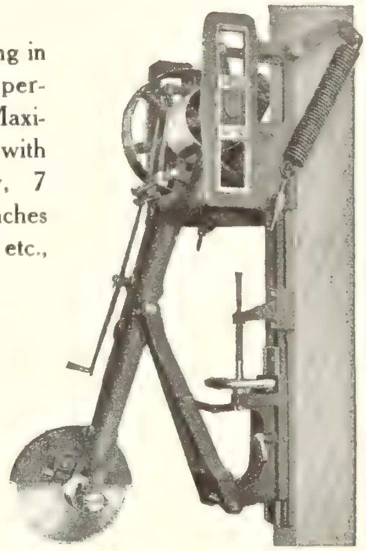
These heads, when open, cut a groove twice the width of groove cut with head closed, and they will cut absolutely any width between these extremes.

Write for Descriptive Literature

FOX MACHINE CO.

645 Front Ave., N.W., GRAND RAPIDS, MICH.

PRYIBIL No. 5 Parallel Saw and Groover



This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

P. Pryibil Machine Co.

512-524 W. 41st St., - New York City

Represented by: Chicago Machinery Exchange

1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited

Hull, Quebec

Stewart-Greer Lumber Company

Band Mills
Mangham, La.

General Offices
St. Louis, Mo.

We ship direct from our own mills. All of our stock is **BAND SAWN**, cut from large Virgin Timber and well manufactured. We are in position to make immediate shipment of the following dry lumber:—

RED GUM
2 cars 1/2 1s and 2s.
20 cars 4/4 1s and 2s.
25 cars 4/4 No. 1 Com.

QUARTERED WHITE OAK
1 car 4/4 1s and 2s.

PLAIN WHITE OAK
15 cars 4/4 1s and 2s.
20 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.
5 cars 2-in. Bridge Plank.

SAP GUM
5 cars 5/8 1s and 2s.
8 cars 3/4 1s and 2s.
25 cars 4/4 1s and 2s.
12 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

PLAIN RED OAK
6 cars 4/4 1s and 2s.
15 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.
10 cars 2-in. Bridge Plank.

Archer Lumber Company

HARDWOOD LUMBER

Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards 28718
4/4 18 in. and up Panel 33905

Southern Red and Sap Gum

Our Specialty

Plain and Quartered sawn, and sorted for Mahogany or Circassian Finish. We guarantee our Gum to be as straight as any other wood. If you have used gum and had bad luck, let us talk to you about it, and if you have never used gum and desire a fine cabinet wood that will take any finish let us tell you how to get the best results. Also

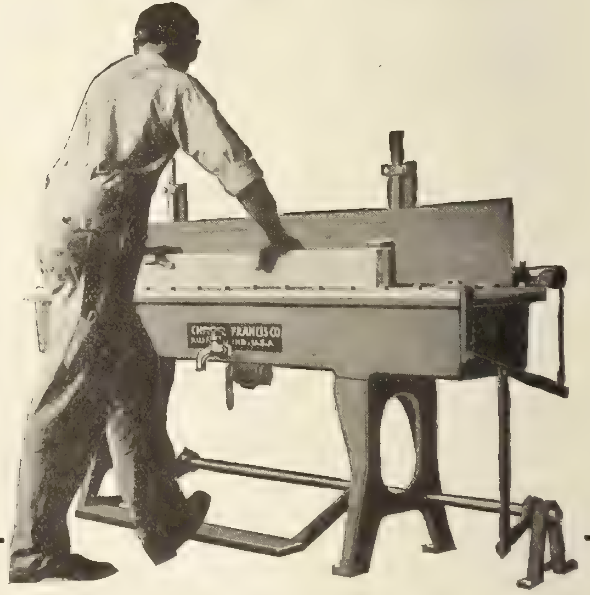
Fine Figured Quartered White Oak

G.H.Evans Lumber Co.

Hardwoods and Pine

CHATTANOOGA, TENNESSEE, U.S.A.

Gluing Joints



A NEW WAY
A FASTER WAY A BETTER WAY

Whether for gluing thick stock, long or short (straight edges or shallow tongue and groove)—or for taped edges of face veneer, it will pay you to investigate this machine.

Panel plants, Furniture, Piano and other manufacturers are enthusiastic over it.

CHAS. E. FRANCIS CO.

Specialty Manufacturers of Glue Room Equipment.
Main Office and Factory: Rushville, Ind., U.S.A.

INDIANA HARDWOODS

Young & Cutsinger *Manufacturers and Wholesale Dealers*

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

OAK
Quality First Brand
GUM

Licking River Lumber Co.
114 Lumber Street
SOUTH BEND, INDIANA

Long-Knight Lumber Company
Circassian, Veneers, Mahogany
Hardwood Lumber

INDIANAPOLIS - - INDIANA

OHIO
Hardwood Manufacturers and Dealers

Distributing yards :—Baltimore, Md., Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co., **CINCINNATI, OHIO.**

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES.

THE
GOTSHALL MFG. CO.
TOLEDO, OHIO
Hardwood Manufacturers

We carry dry stock in

Quartered and Plain White and Red Oak, Ash, Hickory, Cottonwood, Sycamore, Cherry Walnut & Poplar
cut from Northern Ohio timber

¶ We solicit enquiries for furniture, bending and wagon stocks, timber and piling. We have two Band Mills.

Soft Yellow
POPLAR
Extra Wide 1, 2, 3 and 4 inch
5/8″ PANEL STOCK
6″ x 6″, 7″ x 7″ and 8″ x 8″ Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber—Hickory Axles
Cypress

Charles F. Shiels & Co.
CINCINNATI, O.

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker". They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO

Mills:
Kentucky Tennessee
W. Virginia

—We make a specialty of—

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4

Wire our expense if in need of any of above stock.

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chesnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Write for a quotation on this space—it will put you in touch with hardwood consumers.

OAK and RED GUM

OUR SPECIALTY

At our Tennessee mill we are producing some choice

Plain and Quartered Red and White Oak. Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

Prompt Shipments and High Grades our Hobby.

Let us quote you on your requirements.

Mills—TENNESSEE
ARKANSAS

DUHLMEIER BROTHERS

Main Office & Yard
CINCINNATI, OHIO,
U. S. A.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sinker-Davis Co., Indianapoils, Ind.

BAND SAWS
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R.. Toronto.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.

EDGERS (Gang)
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Bass Bros., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Anderson & Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Licking River Lumber Co., South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Sawmill Owners Sales Co., Montreal, Que.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Stevens & Jarvis Lumber Co., Eau Claire, Wis.
Stewart-Greer Lumber Co., St. Louis, Mo.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

JOINTERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Anderson Lumber Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.

MACHINE KNIVES
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Sidney Tool Co., Sidney, Ohio.
Smith & Phillips Mfg. Co., Chicago.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS
Bass Bros., New York.

SANDERS
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Bass Bros., New York.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

SAW JOINTERS
Diehl Machine Works, G. M., Wabash, Ind.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby Company, A. B., Toronto, Ont.
Sheldons Limited, Galt, Ont.
Toronto Blower Company, Toronto.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRINKLER EQUIPMENT
Keiths, Limited, Toronto.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Sidney Tool Company, Sidney, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WINDOW FRAME MACHINERY
Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE
Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher and the Ambitious Student.

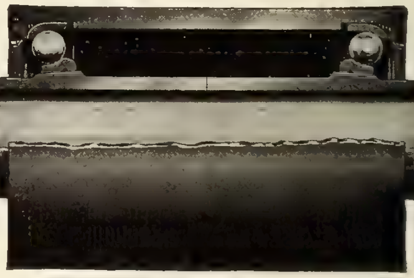
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline **once a year** is all the **attention and lubrication** required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS GLUE

(VEGETABLE)

SETS—STICKS—STAYS

A substitute is commonly understood to be something which will produce "nearly as good" results.

Many glues are substitutes.

Atlas Glue is not a substitute because it produces better results.

Note these points of advantage:

Heatproof,
Odorless,
Reliable,
Economical,
No Hot Cauls.
No Cold Air Blisters,
Sets Properly,
Does Not Injure the Hands.

Why don't you use the best? We don't ask you to take our word, but are willing to show you.

WRITE NOW—RIGHT NOW

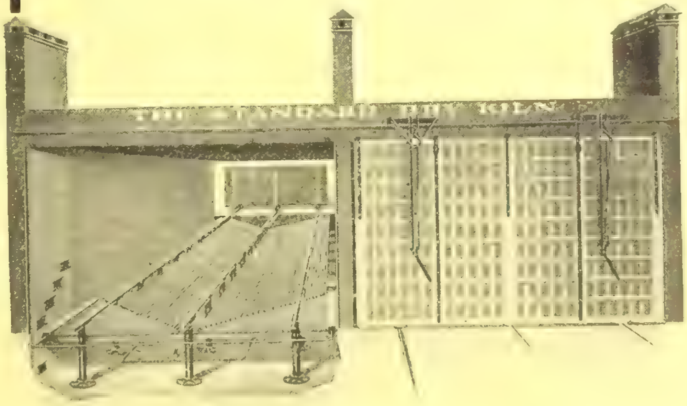
National Process Company
Manufacturers
Address Dept. C. Indianapolis, Indiana, U. S. A.

What Did It Cost You

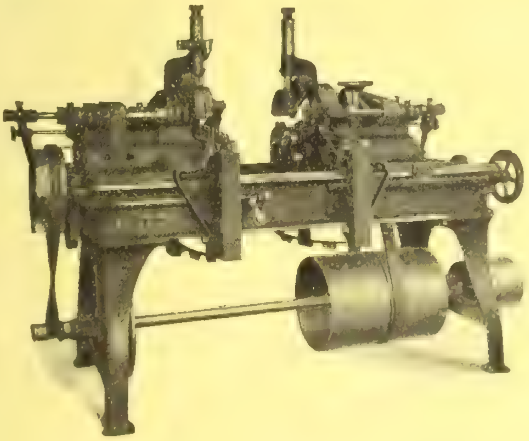
last year to operate and maintain your dry kiln? What percentage was wages of expert labor required to run it?—cost of repairs?—value of time lost through breakdowns?

The Standard Dry Kiln is Cheapest per Year

It has no engine and no complicated machinery. It can't break down. Any of your workmen can operate it successfully and its Moist Air System is perfectly adaptable for drying your lumber. Write for the Catalogue. Address: The Standard Dry Kiln Co., 1560 McCarty St., Indianapolis, Ind.



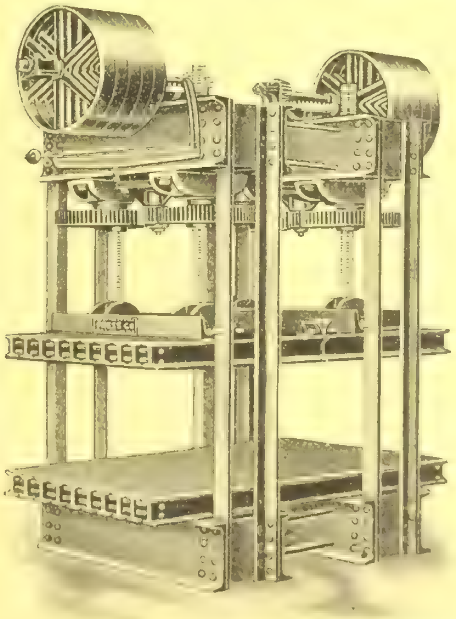
New Spoke Machine



This new machine will equalize one or both ends and chuck tenon for felloe in one operation. Capacity 2000 per hour.

J. M. NASH, Milwaukee, Wis.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL

When all is said and done
it is endurance that counts, both in men and *Furniture.*

MARIETTA FINISHES

give to your furniture something more than the transient beauty that attracts immediate business.

They give that permanent beauty which means long service and satisfaction to the final purchaser.

They are practical, efficient, economical.

Try our 1914 Process
NON-FADING MAHOGANY STAIN.

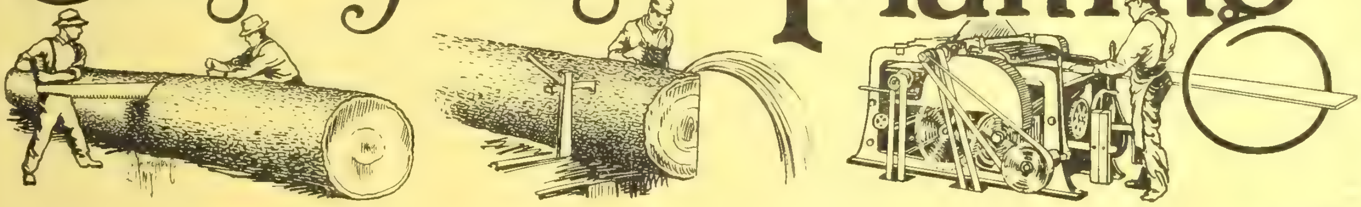
Sample panels sent on request.

Marietta Paint & Color Co.
Marietta-Ohio

Volume Fourteen TORONTO, JUNE, 1914 Number Six

CANADIAN WOODWORKER and Furniture Manufacturer

Cutting – Sawing — Planing



The Planing Counts Most

A planer that does its duty often swings the business up to success—buying a planer merits your deep study.

Fully and frankly, we tell you about

Whitney Planers Single and Double Surfacers

No. 4 Whitney Single Surface Planer

We detail the reasons why the installation of a Whitney will increase the volume of your planing output and better the quality—why the upkeep and operation costs are carried down to the lowest possible notch—how Whitney Planers stand up sturdily to the hardest kind of day-by-day service—we also suggest the most efficient equipment for your work of square cylinders and two or four ordinary knives or round cylinders and four thin high-speed steel knives and jointing, grinding and setting devices.

Just Write Us a Line.

Notice how Whitney Planers are found in woodworking shops that are considered representative.

Baxter D. Whitney & Son, Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives; Henry Kelley & Co.
26 Pall Mall, Manchester, England

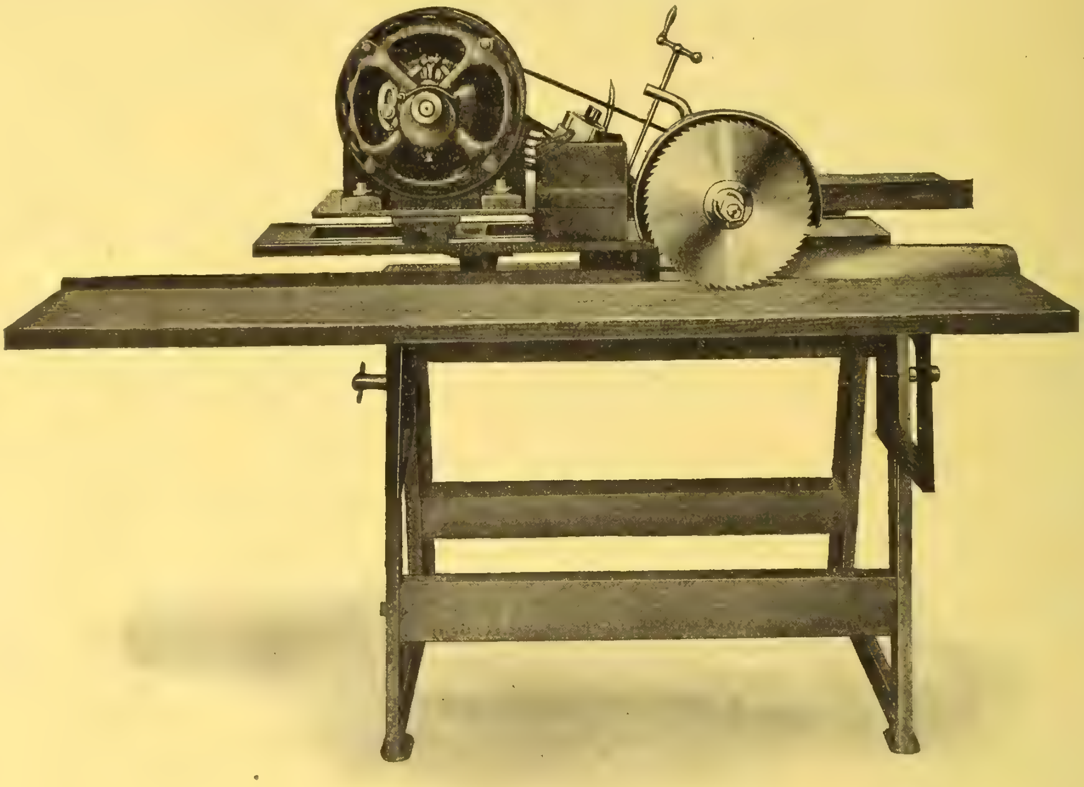
Alphabetical List of Advertisers, page 10

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders, Cabinet Makers, Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

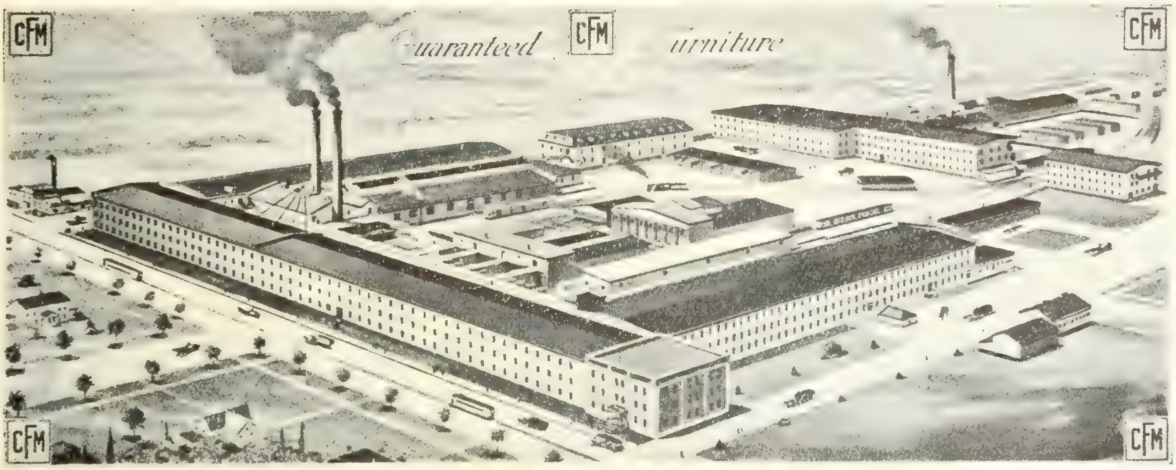
Here are a few people who are using our machines:—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.



CANADA FURNITURE MANUFACTURERS
LIMITED
GENERAL OFFICES
WOODSTOCK, ONTARIO.

June 10, 1914.

Messrs. CANADIAN LINDERMAN CO.,
Woodstock, Ont.

Gentlemen,

With reference to the Linderman Dovetail Glue Jointer, which we have had in operation for the past two years, would say that at the outset there were some handicaps to the most successful results from the Linderman, but these have been removed and we can conscientiously say that the Linderman Process is a signal success for those who will intelligently handle the proposition. We find there is quite a saving in lumber, time and glue, and there is no question of the superiority of this tapered wedged joint over all others.

We will be pleased at any time to show prospective purchasers this Machine in operation at our Woodstock Factory.

Yours truly,

CANADIAN FURNITURE MANUFACTURERS, Limited.

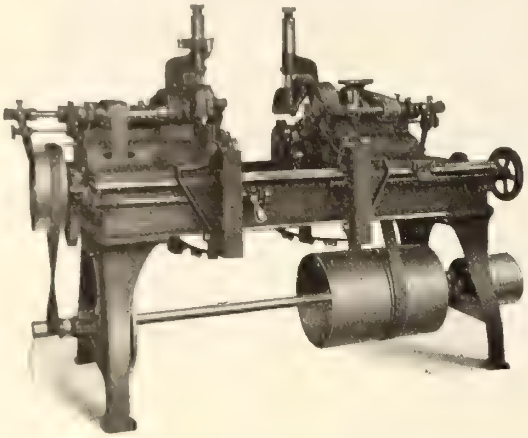
A. H. Watson

General Superintendent.

Cheaper and Better

:: SPOKES ::

Can Be Made

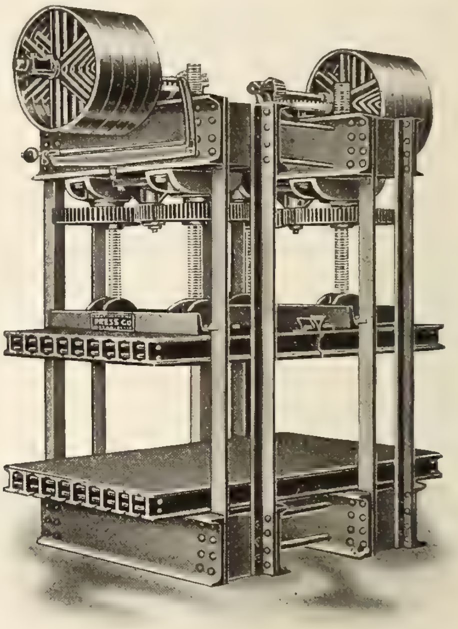


With the help of the new machine to equalize one or both ends and chuck tenon for felloe at one operation.

Capacity 2000 per hour.

J. M. NASH, Milwaukee, Wis.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL

IT HOLDS THE GRAIN—CUTS FAST AND CLEAN—LEAVES A UNIFORM FINISH

Carborundum Brand Garnet Paper

Every good quality that a garnet paper should have is found in Carborundum Brand Garnet Paper—it is all because the grain is clean, sharp—the paper strong, yet flexible—the glue the highest of quality—the process of manufacture so perfected—that Carborundum Garnet Paper, as shown in actual results produced, stands far and above any other make—

Sample sheets will prove —Glad to send them.

The Carborundum Company
Niagara Falls, N. Y.
New York Chicago Boston Philadelphia Grand Rapids Cleveland Cincinnati London, Eng.

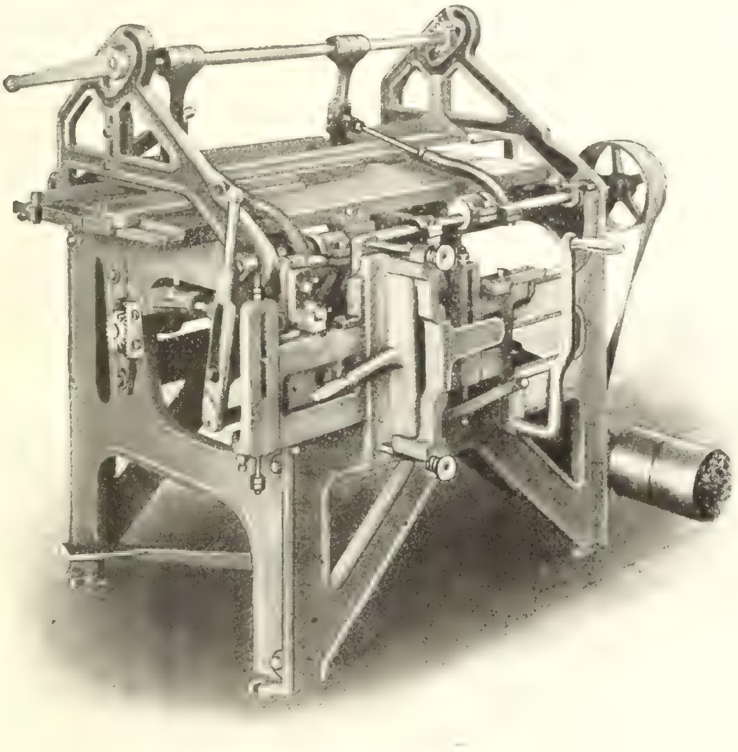
MACHINE MADE

WINDOW FRAMES

A Machine-made Window Frame so far excels a hand-made frame that it is removed from competition.

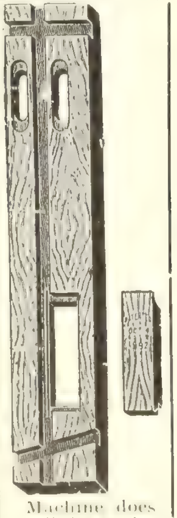
Accuracy, Price, Quality and Quick Deliveries are the reasons.

Among the Canadian factories using our Perfect Window Frame Machine we mention the following:



Perfect Window Frame Machine

Riverside Bros. Company,	Calgary, Alta.
Western Planing Mills Company,	Calgary, Alta.
Rendall, Mackay, Michie, Limited,	Edmonton, Alta.
Terminal Construction & Mfg. Company,	Vancouver, B.C.
Royal City Planing Mills Company,	Vancouver, B.C.
J. Hanbury & Company,	Vancouver, B.C.
Western Sash & Door Factories,	Vancouver, B.C.
Westminster Wood Working Company,	Westminster, B.C.
G. W. Murray,	Winnipeg, Man.
Rat Portage Lumber Company,	Winnipeg, Man.
Winnipeg Paint & Glass Company,	Winnipeg, Man.
J. & D. A. Harquail Company,	Campbellton, N.B.
Haley Bros. & Company,	St. John, N.B.
Chappell Bros. & Company, Limited,	Sydney, N.S.
The Pringle Company,	Belleville, Ont.
Bryan Manufacturing Company, Limited,	Collingwood, Ont.
L. A. De Laplante Limited,	East Toronto, Ont.
M. Brennen & Sons Mfg. Company,	Hamilton, Ont.
Patterson Tilley Company,	Hamilton, Ont.
James Lunny & Company,	Hin onville, Ont.
S. Anglin & Company,	Kingston, Ont.
Davidson & Thackray,	Ottawa, Ont.
W. C. Edwards & Company,	Ottawa, Ont.
S. L. Kyle,	Ottawa, Ont.
The McAuliffe Davis Lumber Company.	Ottawa, Ont.
J. McLaughlin, Ottawa Stair Works,	Ottawa, Ont.
J. M. Green & Son, Limited.	St. Thomas, Ont.
Tillson Company, Limited,	Tillsonburg, Ont.
George Rathbone,	Toronto, Ont.
J. C. Scott Company,	Toronto, Ont.
John B. Smith & Sons,	Toronto, Ont.
R. J. Batt,	West Toronto, Ont
Toronto Junction Lumber Company,	West Toronto, Ont
John Piggott & Sons,	Windsor, Ont.
D. G. Loomis & Sons,	Montreal, Que.
Wm. Rutherford & Son Company,	Montreal, Que.
F. Tremblay & Son Company,	Montreal, Que
Tobin Manufacturing Company,	Bromptonville, Que.



Machine does all the work shown in above cut.

Often a large interior finish contract hinges on your ability to make quick delivery. With our Perfect Window Frame Machine you can outbid the man who uses old-fashioned methods in points of

TIME

PRICE

AND

QUALITY

Write us for particulars

Smith & Phillips Mfg. Company

412-432 N. Sangamon Street, CHICAGO

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

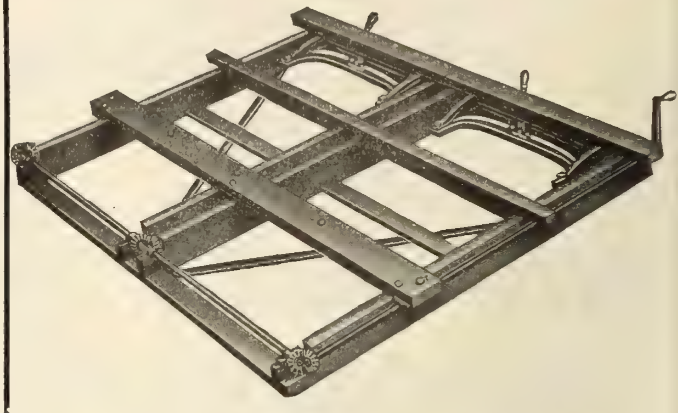
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

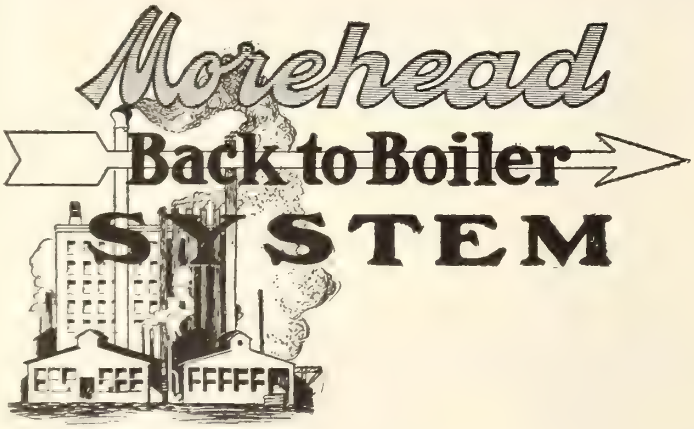
Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.

THE LOGICAL SYSTEM



Picking up the plant's condensation and returning it to the boilers without the use of pumps, without wasting heat—that's the logical way—the Morehead System. For over twenty-four years it has been replacing troublesome traps, hot-wells, and pumps.

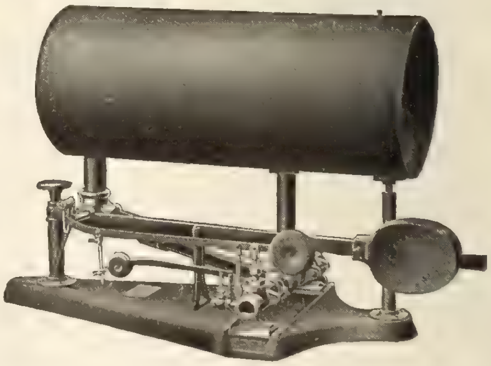
Speaking of hot-wells; every time you send good hot condensate to a hot-well you are sending it there to lose a large percentage of its heat units. And for every 100 degrees F. your hot-well gives up, you lose 10 per cent. of your fuel.

Did you know that?

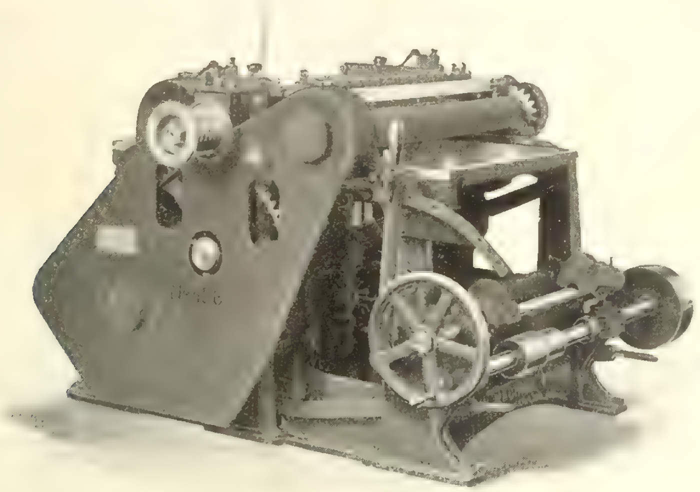
The Morehead Back-to-Boiler System keeps your steam apparatus dry, hot, and increases the circulation. It feeds the condensate direct to your boilers at 290 to 300 degrees F.—it matters not how high the temperature, no heat units are lost.

Isn't it the most logical system to maintain the high temperature so necessary in the drying chamber? And it's so simple, too—so sure. Get acquainted with this expense-saving, profit-producing system. Know why it handles condensation quicker, hotter, cheaper, better. Our engineers will give you the complete information absolutely free.

Write, right now



CANADIAN MOREHEAD MANUFACTURING CO., Woodstock, Ont.



Berlin Surfacers

We have specialized in planing machines for years. Berlin surfacers represent the experience of all these years. You can make no mistake by putting your surfacing requirements up to us. We build surfacers for every purpose. Whatever surfacing you want to do may be done at lowest cost on Berlin.

Are Your Cabinet Surfacers Losing Money For You at the Sander?

Are you thinking of replacing or adding to your present surfacing equipment? Then judge the earning power of Berlin Surfacers by comparing them with others. Mail your card request for complete data now — so you'll have it for reference when you want it.

Don't depend on your sander to correct the inferior work of your surfacers. That isn't profitable. The inefficiency of one machine is handicapping the other.

Surface your stock on the Berlin "156" Single Cabinet Surfacer. Then once through at the sander will suffice. And instead of sanding two pieces at one time the uniformity of the surfacing will enable your sander operator to feed stock across the entire width of the machine. Its efficiency is increased 100 per cent. That assures profit, absolutely.

Equipped with round heads carrying thin steel knives, which may be ground and jointed on the machine, the "156" produces a finish that shines. Sanding all your stock won't be necessary.

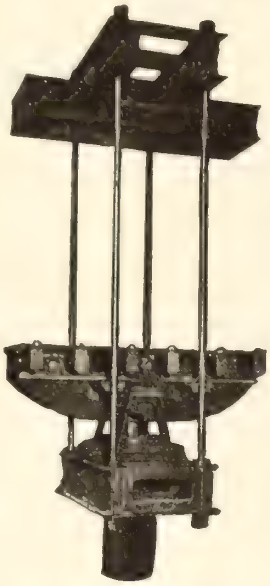
The sturdy construction and the use of only proven design features assures low upkeep cost. There'll be fewer necessary shut downs, less lost time. The top in-feed roll and chip-breaker may be sectional. The wedge method of bed adjustment assures its stability. Fine finish is therefore assured always.

BERLIN MACHINE WORKS LIMITED, Hamilton, Ont.

Largest Manufacturers of Woodworking Machinery in the World

UNITED STATES PLANT, - - - - BELOIT, WISCONSIN

Hydraulic Veneer Press



We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

CLAMPS THAT CLAMP

We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

Send for Complete Catalogue

A. E. PALMER & SONS
OWOSSO, MICH.

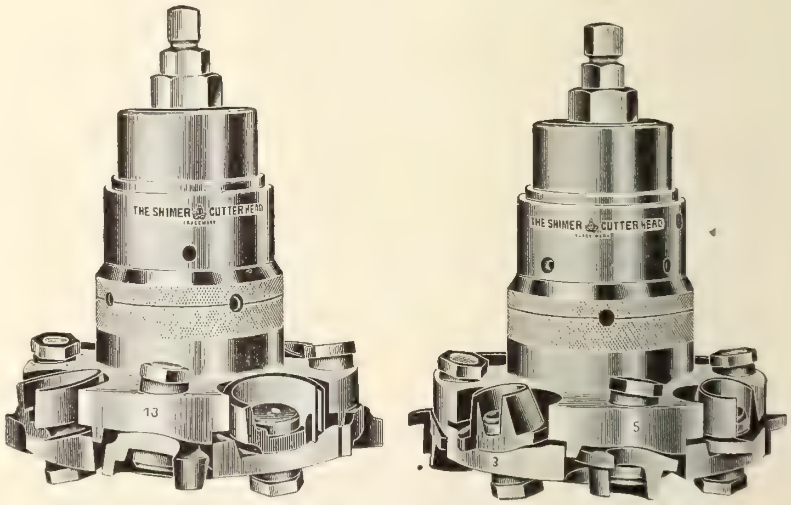
SAVE ALL THE HAND FITTING!

Use Shimer Cutter Heads in which the Bits are simply filed or ground to sharpen and set to a gauge—no more trouble than filing a saw. They eliminate hand fitting and make the men and machines so efficient that a quality product can be turned out in paying quantities. **They save time, save labor, save material**—do away with the fitting, trying and other annoyances, and cut so easily and clean that power is also saved. **They maintain uniform patterns** because the shape of the pattern is turned into the long-life Circular Bits and never changes when the Bits are sharpened.

Shimer Cutter Heads are provided with the latest developments in the art of reducing friction and wear on the knives. The Bits are bolted to Conical Duplex Bit Seats to secure perfect point and edge clearance. Working in pairs and in upper and lower series upon the Head, they divide the cut in a shearing manner, lessening the tendency to pull out knots and splinters on hard and [illegible] grained lumber.

The edge outline of the Bit only comes in contact with the lumber and shapes it accurately. As the cutters are filed or ground to shape on the inside of the circle the shape never changes. All that portion of the cutting edge is brought into service as the cutter is sharpened and brought around upon its holding bolt to again fit the gauge.

There's a Shimer Cutter Head for every kind of matching and moulding service. If you will state your conditions and give us measurements of your machine we will send you the proper tools on free trial. Write us today.



The "Shimer Limited" Cutter Heads, with Expansion, Fig. 627 and Fig. 628.

FOR THE HIGH SPEED MATCHER

These Heads have a chucking device which self-centers them on the spindle and grips firmly thereto when the device is drawn up, overcoming the objectionable set screw as a means of fastening the Head to the spindle. It is reliable and practically perfect in results.

The Bits carry a larger areal surface and the Bit chambers are of greater depth to compensate for the new chisel point given to the Bits for greater relief to the parts coming into contact with the lumber.

They are simple and strong throughout, have no delicate parts to break down or get out of order, and are safe and efficient tools for matching flooring, etc., at high speeds.

Price, net, for Flooring, $72.46 the set complete.

Address: SAMUEL J. SHIMER & SONS, Inc., GALT, Ontario, Can.

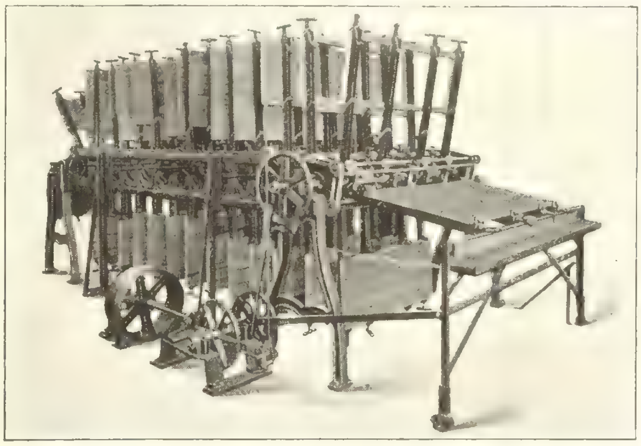
Patented Nov. 29, 1890
July 19, 1912

A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co. Toronto — Canadian Agents — Williams & Wilson Montreal

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

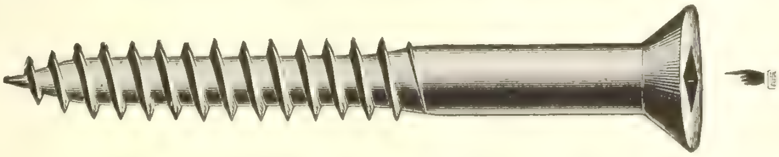
Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

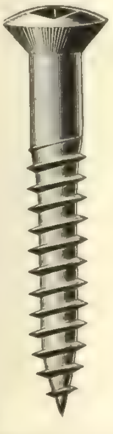
NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

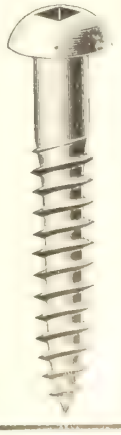
ROBERTSON SOCKET HEAD
Wood Screws



See That Square Hole

Pat. Feb. 2, 1909





THIS IS A REAL WOOD SCREW

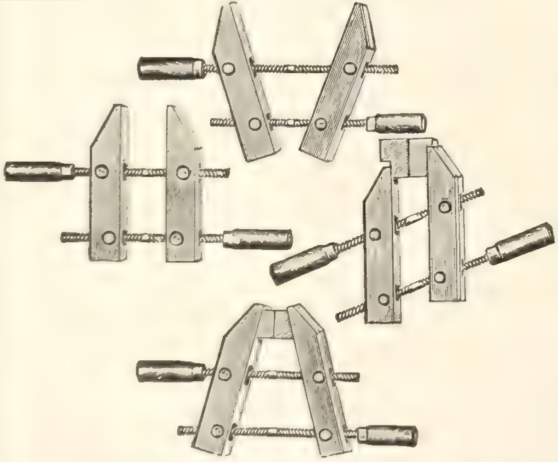
It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO

Alphabetical List of Advertisers

Acme Veneer & Lumber Company	49
Adjustable Clamp Company	10
Andrews Company, A. H.	13
Archer Lumber Company	60
Atlantic Lumber Company	57
Ault & Wiborg Company	43
Berlin Machine Works	7
Billstrom, Nels. J.	9
Black Bros. Machinery Company	13
Buffalo Tool & Supply Company	
Canada Machinery Corporation	14
Canadian Boomer & Boschert Mfg. Co.	4
Canadian Linderman Company	3
Canadian Morehead Manufacturing Company	6
Carborundum Company	4
Central Veneer Company	52
Central Veneer Company	50
Chapman Double Ball Bearing Company	66
Chicago Machinery Exchange Inc.	13
Cincinnati Veneer Company	51
Clark Veneer Company, Walter	50
Cyclone Blow Pipe Company	12
Dennison, Herbert, J. S.	55
Denny, Hilborn & Rosenbach	42
DeVilbiss Manufacturing Company	43
Diehl Machine Works, G. M.	12
Dominion Mahogany & Veneer Company	53
Duhlmeier Brothers	63
Elliot Woodworker, Limited	2
Evans Lumber Company, G. H.	60
Goshen Veneer Company	51
Grand Rapids Hand Screw Company	6
Grand Rapids Veneer Works	57
Haughton Veneer Company	47
Hoffman Bros. Company	47
Huddleston-Marsh Company	51
Huther Bros.	9
Imperial Lumber Company	63
Jamieson & Company, R. C.	41
Keiths Limited	13
Kosse, Shoe & Schleyer Company	62
Licking River Lumber Company	61
Lightfoot, Stanley	55
Long-Knight Lumber Company	61
Marrietta Paint & Color Company	68
Meakins & Sons	41
Morton Dry Kiln Company	
Mowbray & Robinson	62
Nash, J. M.	4
National Process Company	67
National Securities Corporation	55
National Veneer & Lumber Company	50
Ober Manufacturing Company	59
Ohio Veneer Company	47
Palmer & Sons, A. E.	8
Penrod Walnut & Veneer Company	52
Perkins Glue Company	67
Perrin & Company	8
Powell-Myers Lumber Company	61
Prendergast Company	62
Pryibil Machine Company, P.	59
Reflector & Hardware Specialty Mfg. Company	60
Robertson Manufacturing Company, P. L.	9
Saw Mill Owners Sales Company	58
Schmidt Company	43
Scientific American	55
Scrim Lumber Company, W. G.	57
Shawnee Lumber Company	63
Sheldons Limited	12
Shiels & Company, Chas. F.	62
Shimer & Sons, Samuel J.	8
Simonds Canada Saw Company	11
Smith & Phillips Manufacturing Company	5
Spencer, C. A.	57
Standard Dry Kiln Company	67
Stevens & Jarvis Lumber Company	57
Stewart Greer Lumber Company	60
Strong Veneer Company	6
Talbot-Zoller Lumber & Veneer Company	62
Thompson & Company, Lewis	50
Thompson Veneer Company, W. T.	47
Thompson Hardwood Lumber Company	63
U. S. Steel Tank & Pipe Company	12
Walters & Sons, H.	59
Wardell Manufacturing Company	
Whitney & Son, Baxter D.	1
Wilcox & Knapp	57
Young & Cutsinger	61



The Jorgensen Adjustable

is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company

215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng., Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.

For the Money You Pay

SIMONDS SAWS

Give You Better Value

¶ Almost any new saw will cut good lumber.

¶ But,—you have got to wear a saw out to find out what its real value is.

¶ And it's in **real value** as well as **new value** that Simonds Saws excel all other makes.

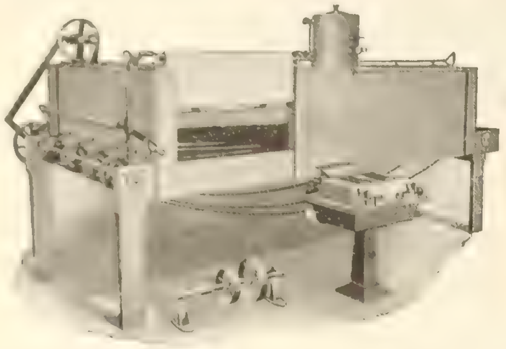
¶ Whenever you are in the market for any kind of a Circular or a Band Saw of any width, or any kind of a woodworking Planer Knife, either regular or high speed steel, be sure and get Simonds prices because it will be more economical in the long run for you to buy Simonds Saws and Knives.

Simonds Canada Saw Co., Limited

St. Remi St. and Acorn Ave.,
Montreal, Que.

Vancouver, B.C.

St. John, N.B.



Automatic Stock Heater and Conveyor

Your Glue Room

We are specialists for the Glue Room. We manufacture everything needed to make it complete. Our equipment is designed to give **Speed—Endurance—Economy**—and includes Glue Jointers, Stock Heaters, Patent Glue and Water Scales, improved Glue Heaters, Glue Spreaders and Glue Clamps, besides a complete line of Cutter Heads.

Tear out this page, put your name and address on the margin, mail it to us, and we will gladly send you our complete catalog.

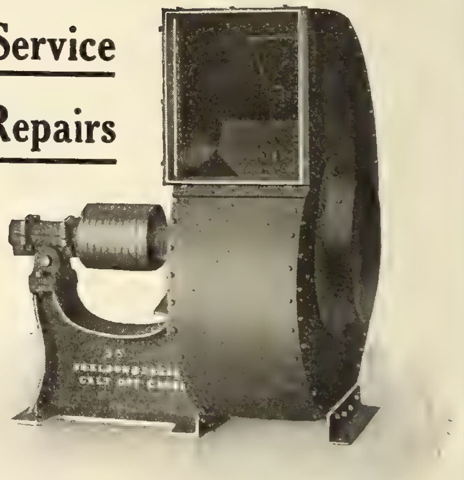
The Diehl Machine Works

On the Banks of the Wabash **WABASH, IND., U.S.A.**

U.S. STEEL TANK & PIPE CO.
CANALPORT AVE & HALSTEAD ST
CHICAGO ILL U.S.A.
ENGINEERS & CONTRACTORS
FOR
SHAVINGS & DUST
EXHAUST SYSTEMS
SLOW SPEED
COLLECTORS
AND
FANS
ETC

Maximum Service

Minimum Repairs



The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

(Patented)

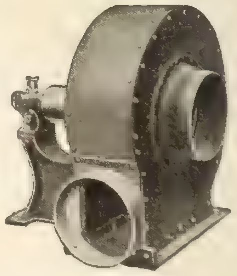
Cyclone Blow Pipe Co.

Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.



WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

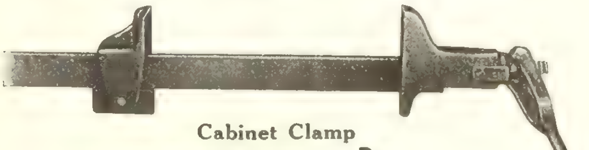
CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

"ANDREWS"
Transfer Cars
Cross or End Piling

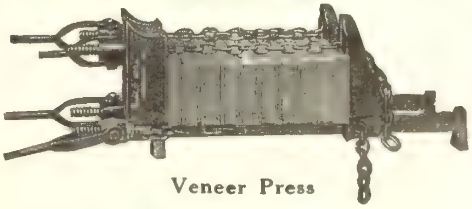
Are of better, heavier design, stronger construction, more effectively cross-braced, and run easier than any other good Transfer Car offered.

For details and prices—
Address DRIER DEPARTMENT
The
A. H. Andrews Co.
115-117 S. Wabash Ave.
CHICAGO

"Pioneer" Moulding Sander
Power Veneer Presses

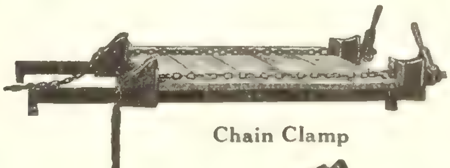


Cabinet Clamp



Veneer Press

Write for
Catalogue
and Prices



Chain Clamp

Black Bros.
Machinery Co.
Mendota, Ill.

Column Clamp

Keiths LIMITED

Automatic Sprinklers

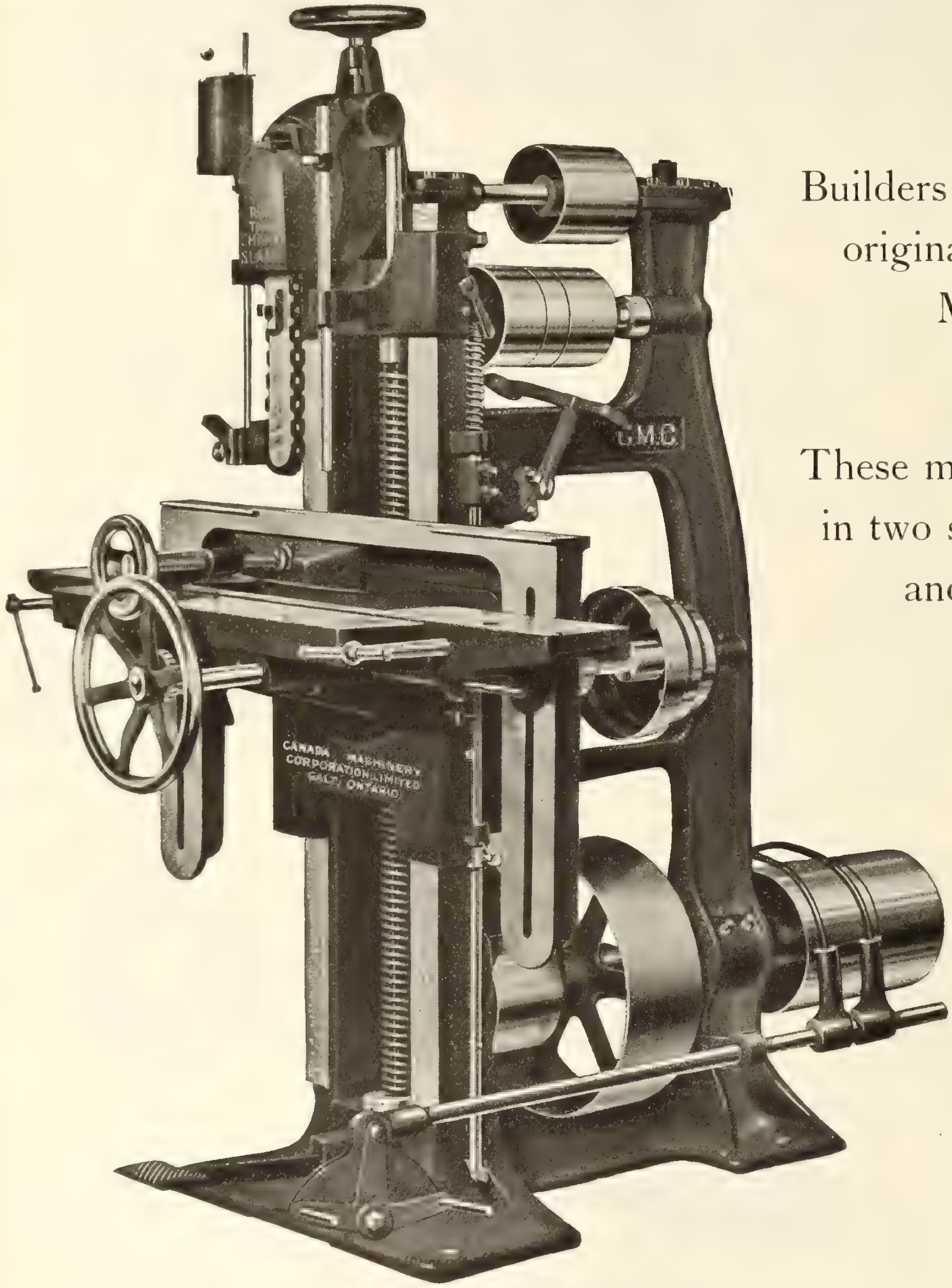
WILL YOU LET US SEND YOU
AN EXPERT FREE OF CHARGE

to show you the best investment you ever made. Many Sprinkler Systems are paying their Owners 50% per annum return on the investment in reduced insurance premiums, and in addition are affording almost perfect protection against loss by fire due to interruption of business.

297 Campbell Ave., TORONTO
707 New Birks Bldg., MONTREAL

Associated Automatic Fire Sprinkler

Chain Saw C.M.C. Mortiser



Builders in Canada of the original Chain Saw Mortisers.

∴

These machines are built in two sizes—No. 551 and No. 541.

Our Bulletins, fully describing these machines, sent on request

∴

No. 541 CHAIN SAW MORTISER

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Largest Builders of Woodworking Machinery in Canada

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring,
woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.

Nicholls Building, Toronto
Phone Ade. 929

Vol. 14 **June, 1914** **No. 6**

Furniture Trade Conditions in Canada

IN common with most other industries, the furniture trade has experienced some of the effects of the general depression throughout Canada during the past twelve months or so. Notwithstanding the rather gloomy complexion of conditions in a business way authoritative opinion regarding the situation discloses the well-grounded conviction that a turn for the better is not far distant. From enquiries made amongst leading furniture manufacturers in various parts of the country the Canadian Woodworker and Furniture Manufacturer learns that, on the whole, the conditions generally are not sufficiently gloomy to justify the framing of pessimistic forecasts with regard to immediate trade prospects. Trade in Ontario, Quebec and the Maritime provinces has often been worse than it is at the present time. There are comparatively few skilled and experienced furniture workers out of employment—in itself a healthy sign. There is a plentiful supply of rough labor available, but this is offset by a scarcity of competent help in the upholstering trade, which latter has been very good for the last few months. There are many who believe that a change for the better, though not immediate, is not at all far distant and that the clouds of depression are passing away rapidly. Factories, generally speaking, are operating from forty to fifty hours a week, with practically their full complement of help, and a few here and there have been running full time, notwithstanding the risk of over-stocking which is pretty general throughout the furniture trade at the present time. Great things are expected from the crop prospects in the West this fall, and Eastern manufacturers who have been catering to the trade in the West are hopeful that, given a bumper crop, the conditions will be likely to improve considerably. With building conditions generally good, and in many places much better than a year ago, there is every reason to look ahead with confidence that before many months have elapsed furniture plants will be running to the limit. While we are reluctant to venture a prophecy regarding the general outlook we are inclined to think that it would take unusual pressure to hold down trade conditions in this country for any length of time. The West undoubtedly has profited by the lessons of the past year or so, and now that financial conditions have become more stable and the country is hopeful of a satisfactory crop return, it is not improbable that while business with the West may not equal that of a year ago, the average merchant will buy pretty largely for his own requirements. This leads up to the conviction that on the whole the volume of business with the West this fall will be sufficient to keep Eastern factories fairly busy. One satisfactory feature of the situation so far is the almost complete absence of price-cutting and the fact that there are manufacturers who have been able to secure the same price for their goods that they were able to command a year ago. Strange as it may seem, prices generally have been wonderfully well maintained. Regarding the cost of raw material there are a few lines which manufacturers are buying at prices slightly under last year's figure, but in the main the cost of raw material has been stationary.

Reports differ widely as to the type of goods most in demand. Several factories are working on new fall designs which we are informed will probably be of a more miscellaneous character this year than was the case last season. Firms which have been running on very strong lines would appear to have been better able to command trade during the present period of depression than they have ever been in the past. Some plants have secured a substantial share of special work which in their case has made the first half of 1914 a record six months in the history of their business. The prevailing opinion inclines to the view that medium and cheap grades of goods are most in demand at the present time. This is no indication that people really want inferior goods. In times of trade dullness the governing factor is the financial status of the purchaser to which every other consideration must always give place. However, there are reasonable hopes of a satisfactory turn in affairs in this respect, especially as financial conditions are tending towards improvement and old debts are being liquidated quite freely. Those factories engaged in the manufacture of office furniture, church furniture, opera chairs, etc., are probably the first to feel the effect of a financial stringency, which, indeed, is the case at the present time. Reed and rattan furniture is enjoying a large sale and manufacturers of this line of goods are enjoying good trade.

Everything considered, trade is well maintained and is little if anything below the volume of a year ago. The general outlook in Ontario and the Eastern provinces is, very promising, although immediate prospects may not appear to be very bright.

Everybody will soon be so busy that this period of dullness will be altogether forgotten. The present seems to us to be an excellent time to get everything in readiness to take care of the trade which it is hoped will be with us in larger measure than ever before.

Organization in the Factory

ONE man alone can do little today. He must have back of him and working in close cooperation with him, men who in some way or other are quite as capable as himself of doing the work that falls to their lot.

Not every man has the genius for organization, inventing and devising means to an end; but we all have it in us to carry out plans in such ways that profit results. That ability may not show itself unassisted, it requires careful development and training.

The value of our efforts, in fact, most often depends upon our training, our development. And that training should not always lead to ability to go our own ways unassisted. It is in our ability to become efficient members of an organization of men banded together for one purpose that the finest success is often attained.

Individuality is a wonderful asset, but it may often be expressed in a more profitable manner than in doing our work in a manner that shows most of all a desire to make personal use of our effort. Many many times the individuality of one man in an organization is able to accomplish more than the whole organization together without him.

There is work in which individuality is paramount; but the great mass of the world's work is better done under close organization, and those who realize this at the outset, generally go further than the men who feel that they must at all costs preserve their own individuality.

Canada's Timber of World Importance

TIMBER has been and will be, so long as man requires houses to shelter him, implements which he may use for agriculture or industries, one of the great needs of the world. In countries where the forests have long been used, such as a great part of Europe, and are no longer capable of supplying the needs of the inhabitants, efforts have been made to take stock of the world's timber supply in order to ascertain from what source the deficiency is to be supplied. As a European writer has said: "It is profoundly disquieting to ascertain that 215 millions of inhabitants of Europe, constituting the nations where commerce and industry have attained the greatest power, do not find enough of wood for manufacturing purposes in the forests of the territories which they occupy."

No country in Asia, except Russia, is able to furnish more than its own requirements. Neither from Africa nor South America can an adequate supply be obtained. Australia can furnish little. The countries which have a great excess of production are only seven in number: five in Europe, Austria-Hungary, Norway, Sweden, Finland and Russia; and two in North America: The United States and Canada. The increase of population and the development of industry in Austria-Hungary, in Russia and in the United States will soon reduce them to the level of non-exporting countries, Sweden, Finland and Canada are the only countries that have a certain future as timber producers.

In the Dominion of Canada the forest area has been estimated as high as 800 million acres, but large extents have been burnt over and carelessly destroyed so that it is doubtful if half that area is really covered by forest. The Canadian forests are, however, producing a great deal more timber by yearly growth than is yet cut from them. If this could be kept up perpetually there would always be a sufficient supply; but fires are destroying considerable areas almost every year, and, as the forests of Europe and the United States become depleted, the quantities required for trade will increase every year.

Protecting Furniture Design

FROM furniture manufacturers there have been repeated complaints regarding alleged design piracy. As to the method employed it is asserted that if any particular article of furniture brings success it is copied immediately by other manufacturers, possibly modified slightly, reduced in selling price and put into open competition. "Instances are not unknown," says the Furniture Manufacturer and Artisan, "in which the actual patterns of certain manufacturers have been bought through dealers by designing commission men or unscrupulous manufacturers and the goods copied literally. At the present time when period furniture is in vogue and when designers are basing their work on the models of the English masters it is difficult to determine whether anyone has a right in the prevailing patterns." In the United States Congress a measure known as the Oldfield Bill, for the protection of design, is pending. The purpose of the bill is not to protect the configuration or ornamentation merely, but to protect the manufactured article embodying the design or having the design applied thereto. Under the section providing the defenses it would be sufficient to defeat the charge of infringement of a registration by showing that the design was old, embodied in the particular product at the time it was registered to the complainant, or that the design was not new and original as embodied in the product at the time of registration. The question of validity and all others affecting rights are thrown entirely into the courts and applications for registration cannot be held up pending the determination of such rights.

Furniture Exhibits at San Francisco

Furniture manufacturers will be in the forefront with their exhibits at the forthcoming Panama-Pacific International Exposition at San Francisco. Every variety of furniture manufactured in every part of the world will be represented on a more extensive and complete scale than at any previous exhibition of the kind. The miscellaneous character of the display may be judged when it is stated that these exhibits will include the furniture used in the home, in the office, in the garden, in the theatre and aboard ship. Owing to the completeness of the display it has been found necessary to classify them between five of the exhibit palaces of the Exposition, in order that every variety may be seen in the proper relation to its particular sphere of usefulenss. In the Palace of Varied Industries will be located displays of fixed furniture used in buildings and dwellings, and of office and home furniture of all kinds. Small fancy furniture will also be shown with these exhibits. Naval furniture and all varieties of ships' furniture will be shown in the Palace of Transportation, while the Palace of Horticulture will contain an array of garden furniture, such as chairs and specially designed seats. The Palace of

Agriculture will be the arena of furniture for stables, barns and kennels, besides a display representing every kind of wood used in the making of furniture, in order that the visitor may acquire a comprehensive idea of the material as well as the finished product. Construction work on all the exhibit palaces is going on so rapidly that their completion by July 1, 1914, is practically assured, thus leaving eight months for the installation of exhibits before the opening of the Exposition on February 20, 1915.

The Value of a Uniform Cost System[*]

By Frederick B. Smith

THERE are two phases of the cost and efficiency question as to what benefits may be obtained from a federated cost system. First, I would like to speak on the question of what constitutes a proper method, and second, the proper maintenance of such a method of cost and efficiency.

(a) It is a system that should give accurate information economically.

(b) It is an efficiency plan that enables an executive to know how and where to cut down operating expenses safely, from a careful analysis of the reports brought in, and where the overheads are higher in departments than they should be, and where the product turned out is not up to the amount it should be, based on cost of labor and material.

(c) It is a plan that enables an executive to know definitely that all items are properly included in overheads, and by that I mean that everything that is not charged directly to labor or material must be included in overhead.

(d) The proper cost system is connected with and is a part of the accounting end of the business, and not only shows the analysis of labor, material and overheads by departments, but also furnishes a balance of your business, and a correct statement of the business situation monthly, or in other words, a perfect running inventory, and complete balance sheet. It eliminates all questions of estimations of materials, and gets down to brass tacks on consumption and distribution of material and labor, so at the end of each month you are enabled to know whether your materials, your stock in process, and your finished stock are in the right proportions to the volume of your business. It gives you a direct pulse. In other words, a proper system is one that is economically installed by a master, not a student, of your business, who comes in with a definite idea of economizing your business effort, but not necessarily to revolutionize your methods.

A considerable amount might be said on this most important and vital subject. There is fully as much danger, in my opinion, of overlooking the cost and efficiency proposition as not doing it at all, and a purely theoretical man can create havoc in a plant. There are all kinds of cost and efficiency men out offering their services, who know practically nothing of the woodworking business, but who would establish a plan based entirely upon their own individual accounting experience. All that is entirely wrong. There are, however, men in this country who are qualified to give a business as much of a tonic, and to add as much strength by a proper cost and efficiency plan as by the addition of any other valuable adjunct to your business.

In other words, there is no more reason why a woodworking plant should not employ a first-class system simply because there are men about who do not accomplish the desired results, than there is that a sick man should not employ a capable physician or surgeon because there are a good many quacks abroad. No well-conducted business today should be without an intelligent and up-to-date accounting cost and efficiency plan.

This naturally leads me to the second part of what I have to say, and that is the all important question of maintenance of the system after once installed. No possible good can be obtained from any plan unless it is intelligently and earnestly kept up each day, and that is particularly true of anything that relates to cost accounting. It must be absolutely kept up, and all reports in such shape that they can be called upon by an executive for reliable information whenever desired, and daily, weekly and monthly reports should be laid upon his desk, giving him a direct knowledge of departments. This can only be accomplished if the proper people are in charge of the work, and in sympathy with it, and there is just as much danger of inefficiency in the carrying out of well set up plans in this direction as there is in not having any system at all. In other words, an inefficient cost system is more dangerous than no system because in one case you depend upon your estimates, which give you some idea of your business, and in the other case you are getting incomplete and misleading information.

When the system has once been installed, the organization as a whole must take hold of it in the right spirit. It should be kept entirely apart from the factory side so far as compiling information is concerned, and yet work in harmony with the factory end of the business, so far as furnishing information as to the conditions that exist is concerned. It should work entirely apart from the sales department, and yet it should be in such shape that the executive can immediately point out to the sales department that certain patterns of goods are unprofitable, and thereby enable him to know that there is no purpose in their further continuance.

It is just as important to discontinue an unprofitable pattern, and more important than it is to add a new one to the line. The danger with us all is the broadening of our lines. As manufacturers we are apt to carry among our good sellers unprofitable patterns. In other words, a cost department should enable an executive to know when it is time to get busy and discontinue an unprofitable pattern.

It is the profit or loss account each month that tells the story. But if the proper cost and efficiency methods work out, it does not take long for the departments of a business to work in harmony with it, and the various departments will have results each month to know whether they are gaining or losing. That is really the one important thing of any modern enterprise.

How can a manufacturing institution obtain this information most desired; who can install the proper kind of a system; how can it be properly maintained? I believe I am safe in saying that a great many plants today haven't attempted to install a cost system, because they do not know what system to put in, what it would cost to operate it. That, in my opinion, is where the federation of cost and efficiency will help the various plants in establishing more universal cost knowledge in their business, and thereby benefit the industry as a whole. I think I am safe in saying further that the average manufacturer who has had any experience and established a system that is satisfactory to himself, is willing to place that knowledge at the disposal of other manufacturers for the purpose of benefiting the industry as a whole. If a uniform plan can be worked out that will give general satisfaction, which I understand has been done to quite an extent in some branches of our industry, not only the members who haven't established a proper cost system will be benefited, but an exchange of knowledge on the part of those who now employ systems will be beneficial. In other words, if a number of our leading manufacturers put all their knowledge in a melting pot, through a proper plan, and get it simmered down to what is good for the industry, we can establish a general plan, I believe, that will fit the industry as a whole.

---

[*] Abstract of an address delivered at the Convention of Furniture Manufacturers held last month in Chicago.

I cannot speak from experience on the subject of association costs, but I can speak from a long experience in developing cost and efficiency methods in our own plant, and will be very glad, indeed, to work in harmony with any plan that may be adopted for the good of the industry as a whole.

The only safe plan to pursue today in the light of modern business methods, if we would raise our industry, is to co-operate more closely, to compete with each other, but not combat each other, to establish a community of knowledge and thereby establish a proper legal community of interests.

The Shipping of Canadian Furniture

The Canadian Trade Commissioner in the West Indies stated in a report recently that Canadian furniture in the cheaper lines would have a much greater sale if it were realized by the manufacturers that the question of freight is still all-important. A small consignment from Ontario which was shipped recently to Barbados, via Halifax, was found to cost about sixty per cent. of its value in freight charges. This was due to the fact that bulky pieces of cheap furniture were packed without being knocked down. Had the shipment been manufactured for export and packed in small bulk the freight would have been reduced so that repeat orders might have been possible. This question of the proper method of shipping furniture is one which calls for the serious attention of the Canadian furniture manufacturer, especially in view of the important bearing which freight charges has upon competition generally.

When it comes to the question as to whether you should pile material on the floor or get more trucks, just bear the fact in mind that a truck will hold more material than can be piled in the same space on the floor and it can be moved a whole lot easier, too. A case in point is the plant of the Beverley Wood Specialty Company, Limited, Toronto, where material is moved on trucks through each department from the cut-off saw room to the finishing department. It takes some money to buy a good equipment of factory trucks, and requires some time and attention to keep them in proper order for best results. But, as one manufacturer aptly puts it, "it is cheaper than time." Trucks are labor-saving agents, and in buying them, as in buying machinery and tools, it pays to get the best and keep them in good order.

Market Wanted for Waste Material

In a letter to the Canadian Woodworker and Furniture Manufacturer, Mr. W. E. McMillan, lumber merchant, Richmond, Va., draws attention to an article which appeared in the May number of this journal dealing with "the market for waste." Mr. McMillan is desirous of finding a market for a considerable quantity of waste material from seasoned oak. He supplies the appended information, which we think will be of interest to woodworkers requiring this class of stock. He writes as follows:

"In connection with my assembling yard at Richmond I operate a modern dimension mill manufacturing chair stock, balaster stock and material for different implements. I am at present working 1-in. and thicker oak in the following sizes: 1 x 3 and wider, 14 to 50 in. clear oak; 1⅛ in. same size for length and width; 2 x 2 and 1⅝ x 1⅝, 18½ in. and longer. In making these sizes there is a great deal of material from seasoned oak perfectly clear for which I desire to find a market if possible. I could furnish about one car load a month of clear oak in 1 in. to 2 in., from 4 in. to 12 in. long clear, and if you can be of any assistance to me in locating a market it is just as likely to do a similar favor for some of your friends requiring this class of stock for saw handles and handles on different kinds of tools. This lumber, I think, would be ideal in the sizes I can furnish."

Changing Styles in Furniture

A New York antiquary is credited with the interesting forecast that an American style in furniture manufacture will be the outcome in the near future of an adaptation of certain features of two or more of the best seventeenth and eighteenth century styles which may easily be brought into graceful harmony. Commenting on this statement the Carpet Trade Review says there are no signs of this visible to the naked eye of the ordinary observer of finishes in America. "Doubtless all will agree that the Mission style will make the strongest practical basis for an American style if we are to have one," observes our contemporary. This would take in the Elizabethan and Jacobean periods as well as the Louis XIV. There might be a good chance of expert designers harmonizing the Mission, Elizabethan and Jacobean and bringing something distinctive out of it. The article concludes with a vindication of lines such as the Mission, Craftsman, Arts and Crafts, and Craftstyle furniture, all of which continue to hold their own.

That there is no "Twentieth Century" style of furniture is the assertion of a correspondent in the daily press recently. The view is held that the twentieth century has no distinctive taste in furniture. The accuracy of this statement will of course be questioned mainly on the ground that in the adaptation of antique styles to modern requirements a twentieth century style has been evolved. Some of the modern Jacobean pieces now on the market are striking examples of this. They possess features quite new, but not out of harmony with the style. These modern adaptations of period designs really constitute a new style, and a meritorious one too.

Efficiency Methods in High Grade Cabinet Work

As Employed at the Up-to-date Plant of the Beverley Wood Specialty Company, Limited, Toronto

Staff Article

ONE of the most up-to-date plants of its kind is that of the Beverley Wood Specialty Company, Limited, Niagara Street, Toronto. The company commenced about five years ago with very limited capital, the entire staff of employees consisting of a man and a boy. To-day the plant gives constant employment to about eighty skilled men. This rapid advance is largely due to the efforts of Mr. J. P. Rahelley, manager, and Mr. A. B. Beverley, superintendent, both of whom are young and energetic business men. Five years ago all the work was done by hand, to-day the plant comprises some of the most up-to-date woodworking machinery to be found anywhere. The company maintain a small engineering staff which is responsible for the introduction of many special machines which have helped considerably to reduce the cost of output. The firm are specialists in cabinet work of the office type and act in the capacity of woodworkers to some of the largest manufacturers in Canada and the United States.

The factory is located in the industrial section of the city where every facility is had for shipping and other operations, the plant being conveniently centered as regards proximity to the railroad sidings. The building consists of five floors and basement, and the area of each floor is 50 ft. x 80 ft.

From the kilns the lumber is taken into the cut-off room, situated in the basement, where all the roughing out and sticking is done. The machinery in this department comprises a cut-off saw, two rip saws, a buzz planer and a sticker. In the Beverley plant nothing is allowed to run to waste. The shavings and trimmings, the collection of the various departments, are conveyed by the Sheldon system of automatic blower from the factory to the boiler room, where they are utilized as fuel. This is found to be sufficient for the heating of the entire plant in winter, also the heating of the dry kilns and of the glue heater in the glue room. The sheds where the lumber is stored are also maintained at a certain temperature throughout the year, as the management consider it essential to the production of satisfactory work to keep the lumber in the best possible condition, which can be done only by uniform temperature. A wing on the same floor as the shipping room is utilized as a box-making department where packing cases of special design are manufactured. Two box-making machines of the latest type, supplied by Cowan & Company, of Galt, Ont., are installed and about one hundred boxes a day are turned out by this department. The machines are the combination cut-off and rip saw type, which effect economy in handling, a most important factor in successful factory management.

The first floor is the trimming department, where all the finer work is done. An interesting feature from the point of view of good work is the lighting arrangement throughout the factory. All the floors are well lighted from both sides and the ventilation, too, is exceptionally good. In the trimming room the machinery constitutes three trim saws, one buzz planer, one Whitney shaper, one Westside band saw, one double spindle boring machine, one double-headed tenoner, one upright hollow chisel mortiser, one 36-in. Whitney cabinet planer. Apart from the machinery the makers of which are indicated, almost all the machinery used by the firm is manufactured by the Cowan Company of Galt.

Exterior view of the Beverley Wood Specialty Company's plant at Toronto.

The lumber having been cut off in the basement and put through the sticker, it is passed on by an elevator of the Otis-Fensom type to the trimming room, where it is glued and trimmed. It is then sent on to the next floor to be sanded. From there it goes to the bench room and cabinet shop. Finally it passes to the last stage of the work, the finishing room. An important feature of the firm's operations is the provision made for rapid and economical handling through the various stages of manufacture. From the time the lumber leaves the kiln until it reaches the finishing room it is never allowed once to touch the floor, all material being carried on specially designed trucks which are claimed by the firm to effect an enormous saving in labor and time. These trucks can be moved about amongst the various machines with ease, and there is no possibility of damaging the lum-

Beverley Wood Specialty Company's plant—The machine sanding department.

Beverley Wood Specialty Company's plant—A corner of the Trim Room.

Efficiency Methods in High Grade Cabinet Work

ber in the various stages of manufacture. Another feature worthy of mention is to be found in connection with the shaper, on which a special cutter is used on all forms of standard work. This does away with the necessity for the setting of knives. Another advantage claimed in addition to the exceptionally fine work done by this cutter is that it renders sand-papering afterwards unnecessary. The glue room, situated off the trimming room, is about 50 ft. square. The Advance Patent Glue Heater of twenty gallons capacity is employed. A veneer press of steel construction, and also of the Advance type, is installed. This press is capable of accommodating a panel 36 ins. x 120 ins. Another glue press is also in operation for special coring stock. As in all up-to-date factories, great importance is attached to the quality and condition of the glue. All the glue used in the Beverley factory is prepared on the premises and made thoroughly waterproof before use.

The sanding room on the second floor contains one 42-in. Berlin three-drum endless bed sander; one Lucas belt sander; one 24-in. single drum sander; one special sander manufactured by the C. Mattison Machine Works, Beloit, Wis.; one special sander designed by the company's own engineering department, for doing all kinds of belt edge work. Another machine in the same department which was also designed by the company's engineers, and manufactured by the Precision Tool Works, Toronto, is a dovetailer and shaper. This machine, which weighs about 2 tons, is a valuable acquisition to the plant. The company claim that it is the only one of its kind in Canada. The machine will dovetail and put in as many divisions in a drawer at one operation as would meet any particular requirement. It is also an efficient shaper and in this respect is claimed to be superior to most other types of machines. It is interesting to mention that trimming and mitering can also be done with this machine by means of a slight adjustment. The sanding room also contains a shaper of the Jackson Cochrane make, and a trim saw of the Ballyntine type.

Beverley Wood Specialty Company's plant—Portion of Assembling Room, showing cabinet work in the final stages.

The third floor is the bench or assembling room where the finest cabinet work is done. In this is included talking machine cabinets, cash register cabinets, music cabinets, etc. In addition the firm turn out a fine grade of interior office fittings, some recent examples of which are to be found in the Allan Line office, King street west, and the offices of the National Cash Register Company, Christie street, both of Toronto. In the manufacture of cash drawers the lightning clamp is used. This clamp is worked by foot power and is so rapid that it will turn out three times the amount of work of the average employee. The firm also manufacture considerable quantities of lavatory seats.

Method is the keynote of everything done inside the factory. Quality is the first consideration and all work is inspected before it leaves the different floors. The finished product is then submitted to a final inspection before shipping. The finishing room, on the fourth floor, is equally well provided for as regards light and ventilation. The different stains and varnishes used in the finishing of cabinets and other work are supplied by the best available makers.

The temperature of the varnish room, which is located on the same floor as the finishing department, is maintained at a uniform rate of about 85 degrees. All the finer work, such as cabinets, office fittings, etc., is hand finished. The different woods used by the firm are quarter cut and plain oak and mahogany for cabinet work, basswood and pine being used in the manufacture of boxes. Hydro-electric power is used throughout the factory, this being found more economical than steam power. Alternative power is provided by a Goldie & McCulloch tubular boiler capable of developing 150 horse power, also an engine, 100 h.p., of the same type. The alternating system of electric current is in operation, the power being derived by two 25 h.p. Jones & Moore motors. The sprinkler system of fire extinguishing apparatus is installed throughout the factory, which is also fitted with telephone communication from the offices on [illegible]

The firm have consistently followed the policy of introducing special machinery rendered necessary by the requirements of the trade, and this enterprising attitude is regarded by them as the secret of the success which they have achieved as cabinet manufacturers in the last five years.

The Wood-Using Industries of the Maritime Provinces

THE Wood-Using Industries of the Maritime Provinces will be featured in a bulletin to be issued shortly by the Forestry Branch of the Department of the Interior at Ottawa. This is the second of a series which will eventually cover the whole of Canada. The bulletin dealing with Ontario was issued some time ago.

In the foreword it is observed that the substitution of other materials for wood in many cases tends to increase the use of wood itself rather than to decrease it. On account of its peculiar physical qualities wood is used for many purposes which would not permit of the substitution of other material. The ease with which wood can be worked into shape is perhaps the one quality which makes this material superior to all others; but the combination of such qualities as strength and hardness relative to weight, toughness, stiffness and elasticity, non-conductivity of heat and electricity, gives us a material for which no substitute has yet been found. In other materials these qualities can be had separately, but never combined in one.

The wood-using industries of the Maritime Provinces, we are told, demand a supply of at least two hundred million feet, board measure, of raw material. Twenty-eight different kinds of wood make up this total, sixteen of which are native woods grown in the provinces themselves. Many of the kinds of wood are in reality groups of species, spruce, for instance, being made up of three, pine of three, birch of three or more, and so on through the list. There are probably over fifty different species of trees which contribute to this total. In some of the industries a particular kind of wood is used because of some particular characteristic which best fits it for the purpose, on account of which no substitute can be found for that wood. In other cases a wood is used because its use has become a habit or because there is a prejudice existing in its favour which has not been overcome although it may not be particularly well suited for the purpose and another cheaper or more abundant wood could be substituted for it. In the majority of cases, perhaps, the woods used are those which are cheapest and most abundant in the immediate neighbourhood, and whose use is, therefore, most economical from the present standpoint.

In many cases, such woods are well suited for the purpose to which they are put. Manufacturers in the Maritime Provinces are proficient in adapting native woods to their own uses, as is shown by the fact that only 12.3 per cent. of the wood used is purchased outside the three provinces.

The tables given in the bulletin are illuminating as to the use of the various kinds of wood. Spruce, pine, birch and balsam fir, all supplied by the Maritime Provinces themselves, are used in large quantities, with spruce an easy leader, of course. A considerable amount of hard pine is imported from the United States. Of the foreign woods, mahogany and lignum-vitae alone are imported, the latter in very small quantity. In connection with spruce it is of interest to note that over one hundred million feet, or 57 per cent of the total quantity of wood used, is of this kind. Spruce and native pine together make up over two-thirds of all the wood used.

By-Products of Manufacture

An interesting chapter of the report is that which deals with by-products—the utilization of pieces of odd dimensions which cannot be used in the main products of the industry. It is pointed out that the greatest saving of raw material and the greatest increase in profit is obtained when a manufacturer makes a study of the uses of wood and in his own factory manufactures by-products of saleable value. Not many years ago most box factories purchased their lumber from the saw mills and manufactured boxes from this. At the present time almost every large saw-mill has a box factory in connection with it, and this industry by itself is a source of profit as well as a means of utilizing much of the rough lumber which would otherwise go to the waste-burner.

This saving can be carried into greater detail with equally satisfactory results where more expensive wood is used in manufacturing more complicated products.

The following list of uses for wood-waste is the result of reports received from wood-using industries in the Maritime Provinces and in Ontario.

Sash and door factories sell or use their short ends and trimmings for the manufacture of apple, fish and other boxes, bathroom fittings, baskets, bobbins, brush-blocks, butter-moulds, dowels, firework-woods, heading, game-boards, insulator pins, ladder rounds, letters for signs, lobster pots, match-blocks, novelties, skewers, spindles, spools, stakes, tool-handles and woodenware. They bale their common sawdust and sell it to butchers for floor covering, to manufacturers of composition novelties, and to screw factories for cleaning screws. They sell shavings for bedding, packing and for drying wet land. Hardwood sawdust is sold for smoking meats. Small waste pieces are sold for making ground wood-pulp, wood-fibre for plaster work, and as a substitute for gravel in concrete masses.

Furniture factories utilize waste in the manufacture of boxes, brush-backs, crates, dowels for export, ink-stands, jardiniere stands, waste-paper baskets, rosettes, stools, tabourets and toys, and utilize cuttings of quartered oak and mahogany for wood carvings.

Boat and ship building firms reported the use of their small waste in the manufacture of boxes, boiler blocking, crates, ladder rungs, pickets, plugs, surveyor's stakes, skids, skis, toboggans, tent-pegs, wedges, and whiffle-trees. They sold shavings and sawdust for bedding.

Manufacturers of vehicles utilized their waste chiefly in the manufacture of handles for small tools, such as chisels, files, hammers or gimlets, and also for the manufacture of dowels, furniture squares, ladder rungs, pump handles and wheel-barrows.

Agricultural implement makers also have a good opportunity of manufacturing tool handles, which many of them take advantage of. They also utilize waste in the manufacture of washing-machine parts and sell sawdust for concrete mixing.

Box and crate manufacturers use their material down to very small cuttings, and consequently have little useful material left. They make butts of hard maple logs into meat blocks and manufacture some small handles and mouldings and sell their shavings for bedding.

Manufacturers of store and office fixtures make staffs for railway flags and use basswood in making mail-boxes.

Foundry men and heavy-machine manufacturers utilize their waste in making battery boxes, skids, crates, pulleys and small parts of patterns, and sell shavings for bedding.

Novelty makers use small pieces of waste in the manufacture of "producer gas." They sell common sawdust for making pincushion frames, hardwood sawdust for smoking meats, and pine and cedar sawdust for metal polish.

Sporting-goods manufacturers reported using waste for spindles, blind-roller parts, brush-blocks and pail-handles.

While sawdust is usually considered as more of a nuisance than a commercial product, it can be utilized for some purposes, depending chiefly on the proximity of the market. A number of methods of chemical utilization of sawdust have been experimented on in the past with varying results. A large lumber concern in British Columbia is erecting a $50,000 plant for the manufacture of sawdust into briquettes for fuel. This plant will have an output of thirty tons of briquettes a day, which will sell for about five dollars a ton at the mill.

The commodities manufactured from the various kinds of wood are enumerated, while a classified directory of manufacturers forms a valuable adjunct to the report.

Utilization of Walnut Waste

MANY useful methods have been found for the utilization of wood waste, but one which is apparently the most commercially valuable has just been reported by the United States Forest Service. Mention is made in regard to Circassian walnut scrap that a Pennsylvania gun company is using the waste pieces of Circassian and black walnut, left after veneer cutting, for the manufacture of gun stocks. This should call for a large quantity of walnut. Commenting on this subject Veneers suggests that the cabinet trade, where most of the walnut is used, can utilize enough of the smaller dimensions practically to clean up the waste. Discussing the best means for the utilization of the material, our contemporary says:

"The right idea for proper utilization of walnut scrap, however, should be not to substitute other woods so much, but, wherever practical, work the scrap walnut into the smaller dimensions that go along with the veneer and with the wider stock. There is not only furniture framing of various kinds and sizes, but there are drawer pulls, buttons, knobs, turned articles and many of the smaller uses to which the walnut scrap can be put, enough generally that if the matter is handled right there need be but little final waste for the scrap-pile of walnut. It should be to the advantage of those interested in manufacturing and working walnut to encourage the use of it in smaller dimensions and strive to make a close clean-up and supply as nearly as possible the entire requirements of furniture and other cabinet work from the walnut itself."

Woods of Silver Grain

Woods having the "silver grain," or as called by botanists, "medullary or pith rays," possess another sort of ornamentation, namely, a sort of dappled effect, or an effect similar to that produced on silk by threads running crosswise to those longitudinally disposed. The European oak, variously known as English oak, Riga and Dutch wainscot, Austrian wainscot, etc., has this peculiarity.

In the oak plank the principal streaks or lines are the edges of the annual rings, which show, as usual, parallel lines (more or less waved) from the curvature of the tree or the neighboring knots and branches. The damask pencilings, or broad, curly veins and stripes, are caused by groups of the pith rays, which undulate in layers from the margin to the center of the tree, and creep in between the longitudinal fibers.

If the fibers in the wood were arranged with the uniformity and exactitude of a piece of plain cloth, there would be an even, uninterrupted color, but since they are arranged by nature in irregular curved lines, every action of the tools partly remove some and exposes others, thus causing a great variety of figure.

To such a boundless extent do the changes caused by tints, fibers, curls, knots, etc., exist that the users of fancy woods scarcely ever seek to match pieces for the purpose of producing uniformity of figure. Diversity in figure is often more pleasing to the eye than uniformity would be, if it were practicable.

An Inlaid Table Map

A remarkable piece of wood carving has recently been completed by a woodworker of St. Louis, in the form of an inlaid table and map of the city of St. Louis. The map contains 200,000 pieces of wood put together on a scale of about 1,500 feet to the inch, and is laid on a table, the base of which is an exact copy in miniature of the east end of the old courthouse at Fourth and Market Streets, St. Louis, from the steps of which slaves were sold before the war. Even the pillars and stones and bricks of the wall and the stone steps are reproduced in replica. The base, that portion representing the pillars and steps of the old Courthouse, is of solid cherry wood. The work represents an astonishing degree of patience. Important places in the map are marked by different kinds of wood contrasting in color. The streets are laid in white holly, city blocks in mahogany, parks in tulip wood, cemeteries in bird's-eye maple, the Mississippi River and all streams inside the city limits, as well as all settling basins of the City Waterworks, are outlined in Circassian walnut, street railways are in red cedar, interurban railway lines in rosewood, steam railroads in camm wood, municipal buildings and lettering in ebony, bridges crossing the Mississippi River are of zebra and burl. The foundation of the inlay is of five-ply basswood, making a plate of 1⅛ inches thick. The inlay itself is of a lock pattern, three-sixteenths of an inch thick, permitting the top to be often refinished.

The woods that enter into flying machine construction must meet the most severe requirements as to weight, strength, straightness of grain and freedom from defects. Spruce, ash, locust and mahogany seem to be leading woods in this work, with hickory entering for certain uses.

The Principle of "Safety First" in Guarding Woodworking Machines

Contributed by Leonard A. Blake

IN the former practice of woodworking factories, and indeed of all factories, it devolved generally on the workman to look after his own safety and also to protect his machine and tools from damage.. At the present day, however, feeling on this subject has undergone a considerable change; a change which would seem to have the effect of diverting the bulk of the attention temporarily from the protection of the machine to the safeguarding of the workman. It is reasonable to assume that the operator has a prior claim to protection from the moving parts of his machine, but at the same time, it appears equally reasonable to put forward the plea that the secondary claim of the machine to be protected from the possibility of damage from its own power, misdirected by lack of thought or care on the part of its operator, should also be recognized.

The safety circular cutter-block is fast superseding the square head for jointers, though it must be admitted that it is not being adopted in some quarters as rapidly as it should be. For this reason it is necessary to take advantage of every opportunity to impress its value as a finger-saver. Some are inclined to make its cutting power part of its claim, but given equal conditions it does not vary greatly in this respect from the square block. Its whole sphere of usefulness lies in its practical inability to sever a finger, a fact which in itself is a reason more weighty than any other which might be urged in its favor.

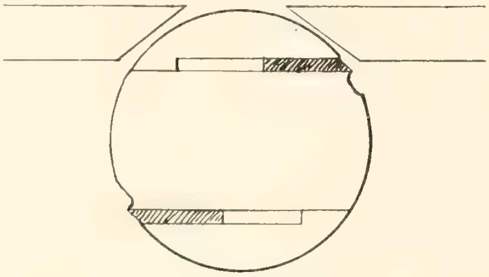


Fig. 1—Safety for fingers.

Absentmindedness on the part of machine operators is frequently expressed by the moving of the head or the table of a sticker or planer when the cutters are in motion, and bringing knives and tables so close that the knives strike. Given a sufficiently gradual movement of the bed towards the cutters it is possible that beyond spoiling the edge of the knives little damage would result. That is providing that the operator was sufficiently alert to detect the contact in time to stop the motion of the table before it reached the thick part of the knives. On the other hand, it is quite likely that circumstances would not combine so favorably. Such inadvertent miscalculations are made by the best of men, but the worst of the consequences of this particular kind of accident can be averted by the simple expedient of running lead into a groove specially made in the bed of the machine opposite the cutters. So simple, it may be said, but how effectual may best be judged when the fast revolving knives are by miscalculation brought too near, and instead of the usual smash there is a groove made in the lead to the accompaniment of just sufficient noise to indicate that the danger point has been reached. No person would be more thankful than the operator when his machine is saved by this simple precaution.

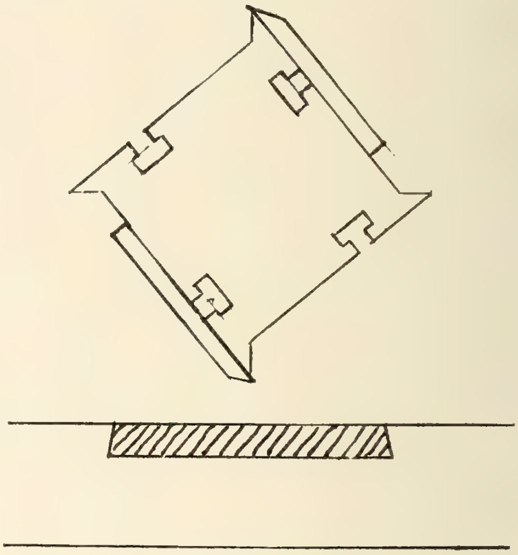


Fig. 2—Safety for knives.

Much might be said on the subject of damage, both bodily and mechanical, that has been caused and will be caused by the seizing up of the loose pulley of a machine when it is being set up. Should one man start up a machine while another was engaged in setting cutters he would be deemed guilty of almost criminal negligence, and it would seem that anyone who would allow a loose pulley to run in such a condition that it would be liable to do the same thing, would be equally guilty. The loose pulley is by its very nature difficult of lubrication when mounted in the ordinary way upon the shaft, and is the more likely to run hot. Two different arrangements have been devised to overcome this evil, one being best for heavy drives and the other for lighter ones, and both of which at the same time render lubrication easier and

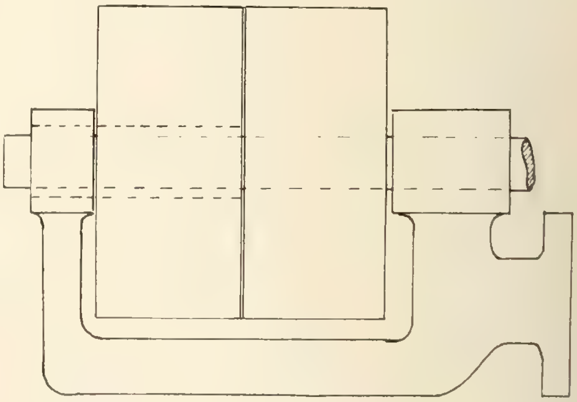


Fig. 3—Safety for hands and wrenches.

remove the danger in case of running hot. For the heavy drives the pulley is mounted on a separate shaft with bearings outside the machine so that lubrication can be attended to whether the belt is on the loose pulley or not. This arrangement is quite a good one for large machines where the extra space taken up by the extended shaft is not so noticeable, but for small machines on which the belt strain is not very great, a more compact device has been evolved. The main feature is a brass or gunmetal sleeve fixed to the outer shaft bearing and extending through the enlarged bore of the loose pulley. This sleeve acts at once as a bearing for the end of the countershaft and carries the loose pulley, and even should the pulley run hot it could not possibly turn the shaft and so set the machine in motion. Figure 3 serves to indicate the application of the sleeve.

In the ordinary course of events it is not easy to receive injuries from the revolving knives of a surfacer nor is it possible to get fingers pinched in the feed rolls unless by extreme carelessness. The planer is more often damaged by the operator than the operator by the planer. One frequent cause is feeding stock which is over the precise thickness for the set of the planer. In other words, the machine is made to take too much at one cut. At first it would appear in this connection that providing the knives would continue to pull through the cut the thickness removed at one time would not be material. What the knives will cut is not a good guide, however, as an average planer will take a cut of as much as ½-inch from lumber up to 3-in. wide, but to force the feed rolls and chipbreaker to accommodate such an oversize is to invite disaster. Therefore when looking over a planer the operator should see that it is provided with a solid bar just in front of the infeed rolls which will not permit of feeding stock over ¼ in. thicker than the size for which the machine may be set. It is a further improvement if the bar is provided with small projections at intervals on the underside so that wide lumber cannot be fed if the cut exceeds one-eighth of an inch. Narrow stuff can be fed between the studs to be reduced as much as one-quarter of an inch without overloading the cylinder.

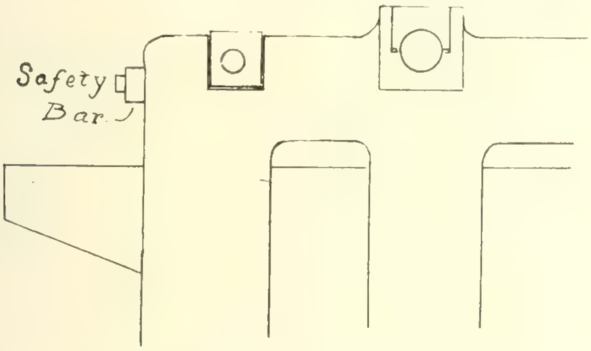


Fig. 4—Safety for feed rolls and chip breaker.

It can at least be said of the safeguards mentioned in the foregoing, that they are positive in their action. It is here the protection of the machine seems to have the advantage over the protection of the employee. Such guards as may be provided for the latter purpose are always likely to be mislaid when most needed, while the former are always on the job.

The popularity of wooden knobs and drawer pulls is such that there should be a chance to turn lots of small pieces of scrap hardwood into these articles.

Manufacture of Basket Rims and Handles

THERE are several different woods which enter into the making of basket rims and handles and there are two general methods for manufacturing them in use. One of these is to cut them on the rotary veneer machine, and the other is to cut them on the slicer.

On the rotary veneer machine is the place to cut handles and rim to turn out the greatest quantity in the smallest time with the least cost for manufacture. Whether it is always best depends considerably on what is required of the rim or handle and the relative importance of saving time and saving timber.

The slicer as a general proposition is a machine on which one can work up some cores and lots of the odds and ends from blocks that cannot be worked well on veneer machines. Blocks and logs that are too rough to make good veneer may by sawing be so worked as to get quite a lot of good material for handles and rims by cutting them on the slicer. In working out this method the stock is cut in the sawmill to boards or flitches as thick as the handle or rim is wide. Sometimes a board may be cut for rim lengths and part of it worked up for these. Then when some knots are found that interfere with the full length the balance of the board may be cut up into short lengths and the good pieces of these shorter lengths worked into handles.

There is one point of difference between rotary-cut stock and sliced stuff here that should be given consideration for at times it may become a deciding factor. This point is that timber cut on the slicer will bend much easier than rotary-cut stock. It is not because of the method of cutting but because of the direction of cutting the timber. As a rule timber peeled right around the block in the way rotary veneer machines peel it is stiffer and harder to bend than if cut the other way of the wood. Therefore when a man wants stiffness as in handles for diamond and square market baskets stock cut on the rotary machine will give more of it. We might argue from this that handles of this kind should be cut on the rotary machine and rims where not so much stiffness is required had better be cut on the slicer. There are several other factors enter and sometimes one of the others outweighs this one.

Allows Use of Waste Material

The short earlike handles used on bushel and briggs baskets have to be bent in such short curves it is almost imperative to cut these on the slicer. Fortunately these come in short lengths consequently they furnish opportunities to use up short lengths and rough sections of logs and thus get the material out of these from what would otherwise be waste. That makes up for the extra work they require in making them by the slower method.

It used to be that nothing much but elm was thought of for making rims and handles, and elm is about the best wood going for this purpose even now, but other woods are used considerably, especially gum, because elm is not always plentiful enough. Even when using elm it is sometimes found that the waste from breakage on handles in the bending room is so excessive as to make them a rather expensive proposition. It is no unusual thing to go into a handle bending room and find broken handle strips almost knee deep and to find that the percentage of loss here may run from 33 1-3 to 50 per cent.

This high percentage of loss is a heavier burden on the cost account than it should be and it is perhaps here that many a man finds more cost piling up on him than he has calculated on.

Whether a man cuts handles on a rotary machine or on a slicer he should give some attention to the nature and quality of the material being used with a view to reducing the breakage loss in handling. It is much better to throw away timber before it is cut than to work it into handles and have it taken to the bending room and then handled by the workmen in there before it is thrown away. Where one is cutting handles on the rotary machine blocks for the handles should be selected with care. First to get blocks that are comparatively free from knots and burls for these cause breakage wherever they occur. The next, one should avoid crooked blocks and blocks with twisting grain. It takes a straight grained, smooth block to give the right kind of satisfaction here, one that is not so much bigger at one end than the other that it will make the cutting across several annular rings of growth. Clear blocks of such shape that the grain and growth of the wood can be followed pretty closely in cutting are the only things that it is worth while working up into handles or rims on the rotary machine. To cut the other kind of a block is to waste enough material to make it cost more than it should cost to select the best kind of blocks for this work.

Use Slicer for Handle Work

Whether there are not enough good blocks to make handles and rims out of clear timber with straight cutting on the rotary machine it were better to cut these on the slicer, for then there is a chance to use up the good part of rough blocks. Rough blocks can be cut on the sawmill into boards as thick as the width of the rims or handles wanted in either multiple or single lengths and then cross cut to the exact length required for handles and rims. These should then be run through a smoothing planer to smooth the sides which incidently makes it easier to see all the defects and follow the grain of the wood. Then they are boiled in vats and cut on the slicer. Here the same pains should be taken in following the grain of the wood as on the rotary and it is much easier to do because even if the boards are wide at one end they can be worked down until the cutting is straight with the grain. By following this method one can get lots of handles and rims from comparatively rough timber and thus effect a saving at the raw material end which makes up for some of the extra work required to make them in this way.

In making them here as well as on the rotary machine some attention should be given to the idea of reducing the ultimate waste in the bending room to as low a per cent. as possible. Do not cut any parts of boards into handles that show knots or will not make good stock. It is better to throw the board away before cutting than to work it up and then throw it away, and besides there is always a chance to utilize the stock for something else if it is not worked up.

The big worry and the great loss in connection with handles and rims is in the percentage of waste in using. No matter which process you make them by or what kind of timber you work into them seek for ways and means to reduce the percentage of loss when it comes time to use them. Select better blocks and take more pains with the cutting for it is better to spend a little more time and money here than to lose so much time and material in working up.—Packages.

Sanitary Hardwood Doors

THERE are various ways of making flush doors. In a country where veneers for the cores and cross-banding are plentiful and cheap, and in a mill equipped with glue-spreading machines and veneer jointers and strippers, it is best, writes G. T. H. in the Woodworker, to make the center core like a five-ply panel, then apply the finished veneers as a later process. When completed such doors usually have joints at the outer edges showing the construction—see Fig. 1.

Caution should be exercised in using two kinds of veneer where both sides of the door must match different finish. Some kinds of wood will draw, expand and contract in such a way as to cause the door to be bowed. Experience alone will enable one to do good work and to overcome faults in construction.

In some localities, where raw material for cores must be lagged up from solid lumber, another method is used, as follows: Glue up the stock in blocks in the same manner as is usual in making panelled veneered doors. Make them of a width that will suit the most convenient size of veneers the market affords or that you have in stock. Say, for instance, a door 3 ft. wide will require four 9-in. widths or five 7 1/5-in. widths; lay out the quantity and sizes to suit the order and the stock most economically. Glue edge strips on outside edge of the blocks intended for the outer edges of the door only.

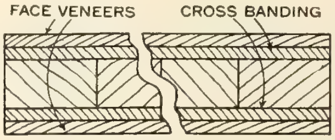


FIG. 1

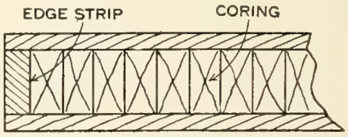


FIG. 2

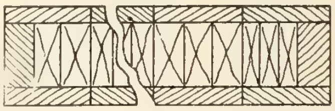


FIG. 4

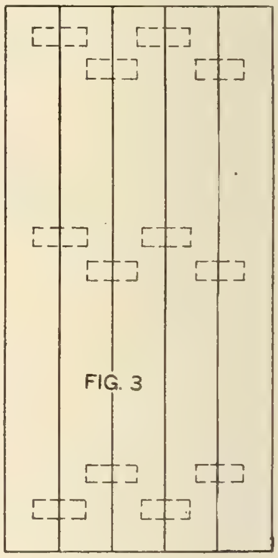


FIG. 3

"Some kinds of wood will draw, expand and contract."

Size up these blocks for width and thickness and veneer them as usual, making the required quantity of pieces to complete the various numbers and sizes of doors. Your stock will now appear as shown in Fig. 2, in end or cross-section. Joint these pieces, both edges square and true, to make glue joints. Lay out the edges and mortise them for slip-tenons, as shown in dotted lines of Fig. 3. These slip-tenons should be about 4-in. wide and the length equal to twice the depth of one mortise cut, less the clearance. The thickness may be the usual thickness of any tenon for a standard door of the finished thickness required. For instance, for 1⅜-in. doors a ⅜-in. tenon, for 1¾-in. or 2-in. doors a ½-in. tenon, and so on.

Slip the tenons into the slabs as you assemble them for gluing. Glue the mortise and dip each tenon into the glue. Spread glue evenly on the adjoining edges of each separate part, selecting those having edge strips for the first and last piece. These pieces need to be warmed in the caul box before the glue is spread. Clamp them up, keeping them even and square at the ends, as well as straight across and out of wind. The cross-section will now be as shown in Fig. 4. Set the slabs aside until the glue has set firmly. Leave them long enough to hold well while they are run through the polisher, after which process you have a good, strong, durable, sanitary slab door.

If your joints are well made and the man who laid them out used proper care to match up the pieces for grain and color of wood, it will be difficult to detect the joints. Doors may be made in this way of any kind of hardwood, poplar, pine or fir, and it is quite surprising how well they hold up in use.

Why Band Saws Snake or Lead

By Hapsburg Liebe

THERE are a number of causes for this pair of very undesirable features in band-saw practice. The most aggravating cases, however, are usually brought about by two or more of these causes, and they generally occur with the beginner; he allows one thing to go wrong while his attentions are turned to another.

Tension wrongly put in, the plate being out of level, a back that is too tight for the front, faulty tooth-fitting, and some fault in the machine itself, are the most prominent of these factors that cause a band to run untrue and spoil otherwise good lumber—and not frequently lose a man his job. To take up the first in the line in which they are above enumerated:

A bandsaw may have so much tension—as tension is generally understood that it will not lie flat of its own weight on the leveling-block, and yet not be tensioned rightly; a saw may drop below the gage that the best of filers recommend as being of the correct circle for the particular width and thickness of blade one is using, and still not be tensioned rightly. To offer an exaggerated illustration, one may take a saw that is perfectly flat, with no tension whatever, and roll it so hard on a single line in the centre that it will buckle up on the bench as though it were loaded to death with tension from edge to edge. And here I may illustrate another point—and, as well, add a word of caution: If the saw is made to fit the gage instead of dropping below it, one may readily detect this one loose place in the middle and the corresponding tight places in either quarter; if the operator is in the habit of allowing his saw to drop below the gage, the tight places on either side of the centre are not so much in evidence. Therefore, I advise making the saw fit the gage; it will show up many tight spots below. If the gage is not of sufficient depth, get one that is. If you happen to be a beginner, read this paragraph again —then cut it out and paste it in your hat.

One of the most fruitful causes of leading—it is commonly called "bull-heading," and it isn't an unsuitable name by any means—lies in having too wide a tire on the front edge. (Here allow me to add that too wide a tire on the back is almost as bad in that it decreases the working width of the plate and keeps the saw from taking the feed it ought to take). To find out how wide your tires are, hold the saw upward with one hand, and with the other rock the straight edge over the inverted drop. Wherever there is a flat place, or a place that shows hollow under the straight edge, that place is tight. I regard this an infallible test.

Of course to keep narrow tires on a band—more especially, be it observed, the toothed-edge tire—means that the saw will pull out quicker, and therefore require more working in order to keep the tension in and the back sufficiently long to allow the front to catch the proper tautness when on the wheels. But right here is the secret of success—one of the secrets of success, at any rate; and if the filer hasn't time on account of other work to keep his saws as they should be kept, it is surely not his fault.

A saw that is out of level can do any sort of devilment that one can imagine; the whole basic principle is put away by this. The outside of the blade, for reasons too obvious to need enumerating here, is the quickest to become lumpy, and is therefore the side which the filer should watch particularly; and it is also the side upon which the filer should finish when working the saw at the bench. Leveling the teeth, in my way of seeing, is one of the most careful and delicate operations in the upkeep of the steel ribbon. The teeth being subjected to so much friction by the sawdust and the sides of the cut—and perhaps they are worn a little by the clampscrew of the swage—become slightly thinner than the other parts of the saw; and if one does not make allowance for this in leveling, he may find a lead that will be hard to account for. Moreover, the teeth show up light under the straight edge more readily than the other parts of the plate, owing to the fact that there is always a throat to each tooth.

A back that is too tight is another prominent cause of badly sawn lumber, as even the inexperienced man can see if he will think about it for a minute. The heating of the toothed edge from friction is sufficient to cause the front to become too long for the back if the saw had a straight back to begin—which is another way of saying that the crowned back is the thing to use.

Next comes faulty tooth-fitting. If the teeth are so blunt that they scrape instead of cutting, or if they are so thin that they chatter and are easily bent to one side, then the saw is apt to snake or lead. If the grinder does not grind squarely, or if the swage or shaper is not doing its work as it should be done, the same undesirable features may be in evidence. A cardinal sin with the beginner lies in swaging out the points too wide, and afterward overworking the steel with the shaper in order to get the points down to the proper width; this takes the life from the steel, and causes the points to soon crumble. Many a good saw is sent back as worthless, and many a good emery wheel is relegated to the scrap heap, because the young filer didn't know. If the steel is hard enough to hold tension well, it is too hard to admit of kneading.

The machine itself may cause its saws to run badly, no matter how well they have been fitted. By all means the rolls should be in line with the saw; and by all means care should be taken to see that the guide stands at the same place with regard to the blade when it is up and when it is down. When the wheels have become badly worn on the front, the case may be help ed somewhat by adding more crown; but the proper thing to do is to have the wheels trued up. Too much crown may suit the bad condition of the wheels; but it causes the blade to flutter on the back, and vibration knocks out the guides and bears the unsavory reputation of having at divers times caused the saw to crack.

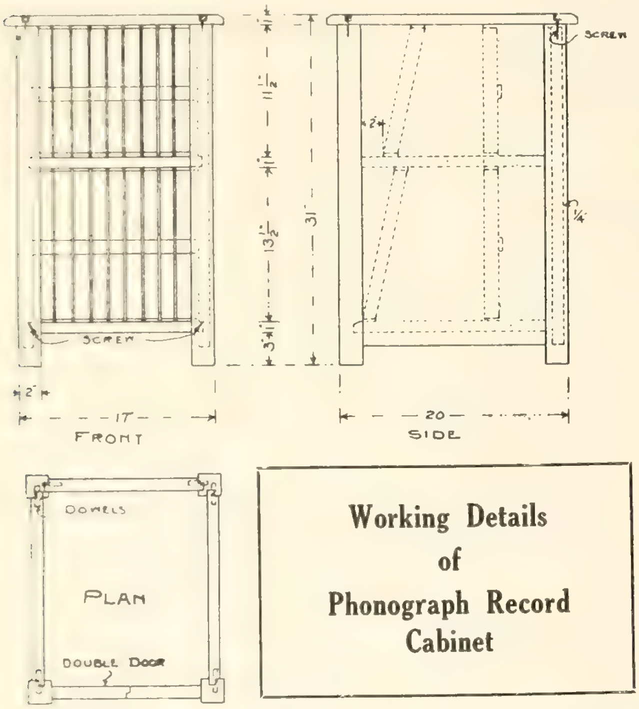
Never line up the wheels without lining up also the guide and the rolls; it won't take long to do this latter, and it is a measure of precaution that may pay big dividends in satisfaction.

How to Make a Phonograph Record Cabinet

By F. A. Schilling

THE construction of the cabinet is such that it can be made in any home work shop. The material can be obtained in any mill, or may be bought in the rough and dressed to size with ordinary carpenter tools, though it is better to have it milled to proper size.

First, remove all mill marks and square up the posts. Select best sides of the material for the outside. Sides and back should next be jointed together, using dowels, at least three to the joint. While they are in the clamps, drill dowel holes in the posts and lay out the mortise in the posts to receive the sides and back. Great care must be exercised in laying out mortises and dowels, so that they will fit properly when put together. After sides and back have set, square them up and dress off the surplus glue and cut mortises in them to receive the shelves. One-quarter inch mortises will be sufficient for the shelves, also for the posts. The object in mortising the sides and posts together is to avoid light showing through the joints should they become loose later on. In laying out the mortises, use a marking gauge.



Working Details of Phonograph Record Cabinet

Next, get the shelves ready, joint together, and then cut to size to fit mortises and posts. The back and shelves must be put in at the same time. It is not necessary to dowel the shelves into the sides, as the back will hold them in place, as will also the top. After the cabinet has set, the top should be put on, using 2½ or 3-inch screws countersunk into the top, doweling the hole. While the cabinet is in the clamps, get the partitions ready. The interior of the cabinet must be stained before the partitions are put in, and the partitions also must be stained before they are put in place. The bottom and top rails are to be put in—the back ones first—and the partitions cut to proper length. Be sure and put in the back stops first, this to prevent records from going too far back. Partitions should be set with brads and glue. Put a screw through bottom shelves into side of cabinet to keep it from spreading; also use glue blocks liberally.

The cabinet should now be scraped and sandpapered and all marks and traces of glue removed. Then fit and clean the doors. The four edges of the top should now be champfered, after all sandpapering has been done, to make a nice clean-cut corner. The hardware should be selected to match the trimmings on the talking machine. The cabinet is now ready to be finished.

Bill of Material for Record Cabinet

Posts, 4 pieces, 2 by 2 by 30 inches, S-4-S.
Sides, 4 pieces, 1 by 8¼ by 28 inches, S-4-S.
Backs, 2 pieces, 1 by 6¾ by 28 inches, S-4-S.
Doors, 2 pieces, 1 by 7 by 28 inches, S-4-S (rabbetted).
Top, 1 piece, 1 by 10 by 19 inches, S-4-S.
Top, 1 piece, 1 by 12 by 19 inches, S-4-S.
Top shelf, 1 piece, 1 by 8 by 15 inches, S-4-S.
Top shelf, 1 piece, 1 by 9 by 15 inches, S-4-S.
Bottom shelf, 1 by 8 by 15 inches, S-4-S.
Bottom, 1 piece, 1 by 9½ by 15 inches, S-4-S.
Partitions, 16 pieces, 3/16 by 2 by 12 inches, S-4-S.
Partitions, 16 pieces, 3/16 by 2 by 14 inches, S-4-S.
Partitions, 8 pieces, ¼ by 2 by 14½ inches, S-4-S.
Stops, 2 pieces, 3/16 by 2 by 14½ inches, S-4-S.
Dowels, 40 pieces, ⅜ by 3 inches.

Select the finish to suit the finish of the talking machine. If it is to be waxed, get the proper shade of art and crafts stain and stain it. Allow it to dry the proper length of time, then give two coats of good, prepared wax, colored same shade as stain, and allow 24 hours between coats and polish between each coat.

If the cabinet is to have a varnish finish, stain as desired and give a coat of orange shellac. Allow it 24 hours to dry, and sand lightly with 00 sandpaper. Next, give a coat of filler, colored to match, and when this has dried to proper length of time, rub down, being sure to rub across the grain of the wood. Then give the cabinet at least three coats of good cabinet or rubbing varnish, being sure to keep each coat thin. Allow to dry 24 hours between coats; also rub or cut each coat with 00 steel wool. Allow the last coat to dry four days and rub down with powdered pumice stone and raw linseed oil.

If desired, the partitions may be made of one piece of material instead of two narrow pieces.

Two-Spindle vs. One-Spindle Shapers

Contributed by B. Lyons

As in most cases of alternatives each is undoubtedly best in certain spheres. The only occasion on which it is either necessary or desirable to enter deeply into the relative merits of the two types is when a case is met with that is not covered by previously well established practice and experience. At the present time there are not many lines in the woodworking industry that have not been assigned pretty definite routes as far as layout and type of machines is concerned, and one would naturally be led to expect that the use of the two types of shapers would also have been covered-in-like manner. In fact their use was so decided until the introduction of the solid head, which considerably extended the field of the one-spindle shaper.

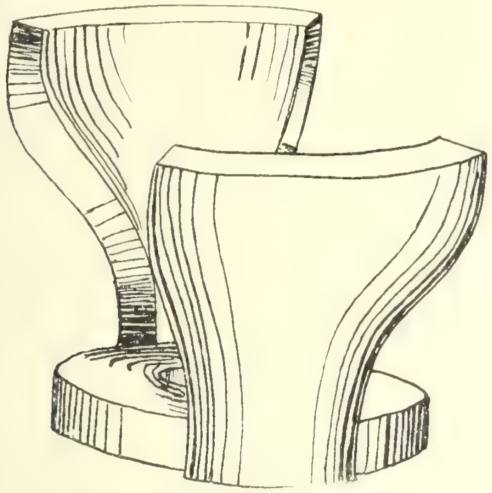


Fig. 1—Double cutting head for ogee mold.

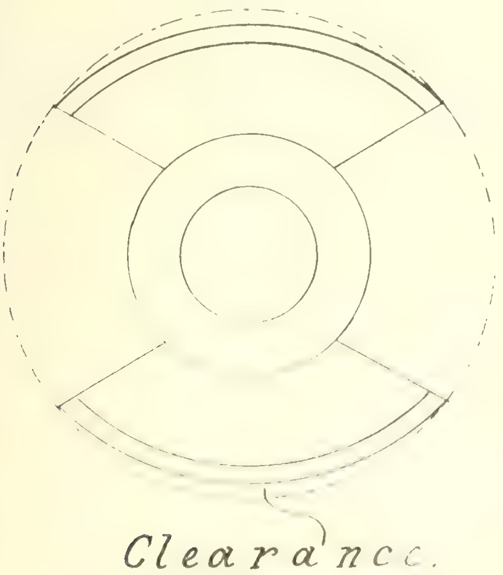


Fig. 2—Plan of double cutting head.

It may be mentioned, however, that by one-spindle shaper is not meant the light reversible sort of machine sometimes known as a frizzer and used for small slotting, etc., but a machine fully equal to a true shaper except in the number of its spindles.

Before the solid cutter was brought into general use the single reversible shaper was under one great disadvantage compared with the double-headed machine. That was the necessity for entirely resetting the machine before any cutting could be done in the opposite direction. With a pair of single-cutting solid heads, however, the setting up was made a much shorter operation. Then upon the introduction of double cutting heads the need for resetting was also done away with, thus representing another big saving of time over the loose knives and collars.

It seems almost paradoxical that one head can be so sharpened as to cut in either direction of revolution, since both the cutting edges and their opposites must be in the same circle, which would make it appear that edges not actually cutting must rub and burn. In fact it is only by careful sharpening that these heads can be made to do the best work. As the outer curve of the head is made to a larger circle than the actual cutting circle so as to keep the cutting edges ahead of the body of the head, care must be taken to file each surface equally to ensure that each edge will do its share of the cutting without rubbing when the motion is reversed. For a head as illustrated by Fig. 1, a small half round file should be used so as to follow in some measure the shape of the cutting edge and preserve an equal cutting angle at all points along the edge. Fig. 2 shows the same kind of head in plan, illustrating the clearance of the body of the head. A solid head of the type shown in Fig. 3 is a valuable acquisition to any shaper having fairly heavy cuts in hardwood and in work in which it is necessary to go against the grain. Toilet frames represent the only one that can be depended on for uniformly good results on this work. The head has six cutting edges and they are all sharpened on the front with a small emery wheel. All this then, tends to indicate that the single spindle shaper finds its most useful application in work that can be easily cut with double cutting solid heads. Naturally large hardwood moulds do not come under this category so that the general mill seems more the place for a single spindle than the factory. The mill combining sash, doors and general mill work, where the bench men use the shaper as one of their tools, and in fact make it take the place of a whole box full of hand tools, is the place for a single spindle shaper. By having the spindle the same size as that of the sash sticker, or by having a sleeve made to bring it up to that size, it can be made to take the sticker heads when it is desired to do a small quantity of a different mould without upsetting the sticker, as for instance when a piece of sash material gets broken in putting together, and it is necessary to replace it hastily.

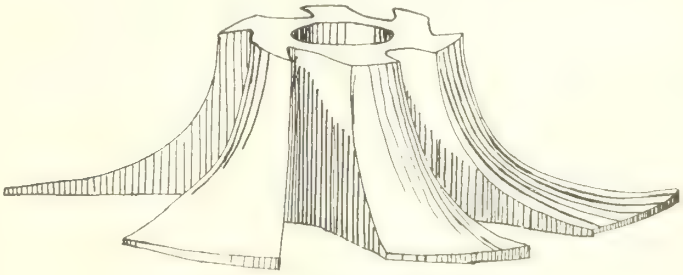


Fig. 3—Six-cutter solid head for toilet frames.

It will help the even sharpening of double cutting heads if they are used equally in both directions when on straight work. There is a natural inclination to run right handed on straight grained stock, but as with running material always through the middle of a planer, it upsets completely the adjustment of the knives.

Rule for Laying Out Moulding Cutters

F. B. Reeve in The Wood-Worker

SEVERAL years ago I tried in every way to find some method by which I could lay out moulding machine cutters so that when ground they would produce the exact moulding called for, without being changed. From time to time I tried everything in this line shown and found that most of them required too much draughting to be of practical use in the tool room; others, such as cutting the piece of molding to a certain angle and then grinding the cutter to that shape, while near, will not produce exact results. The method mentioned may be employed with fair results where the moulding is less than 1-inch thick, yet on a moulding 2 inches thick it is very inaccurate.

I felt that what was needed was a rule so graduated as to give the exact projection desired, and will explain how I finally made such a rule. Those who care to take the trouble to make one can do it themselves, and, having made it, can then forget about making any allowances for projection. Once made, the rule will last a lifetime; I have one that has been in use over twenty years.

First lay out carefully the moulding machine head, as shown in Fig. 1. The drawing should be full size and show how much the straight cutter projects beyond the head. With the center of shaft, E, Fig. 1, as the center and the edge of the straight cutter as the radius, describe a portion of a circle. This is the cutting circle of the straight cutter. Project the line A B indefinitely. Parallel with the line A B, and through the center of shaft E, draw line C D. These lines are the foundation of the rule to be made.

Take a piece of common 2-ft. rule and plane off the figures on the side showing the ⅛-in. divisions. Take another rule on which you are certain that the divisions are accurate, and place it on the line C D, with the end of rule at the cutting circle as shown, and fasten it securely in this position. Now place the piece of rule which has been planed off, on the line A B. The end of this rule must be in contact with the cutting circle and it must be placed so that the 1/16-in. divisions are face down upon the paper and pointing toward the common rule. Thus, when the new divisions are marked upon the planed surface, they will be upon the opposite edge from where the old divisions were. This is done to obviate the necessity of turning the rule end for end when making the different measurements. After ascertaining a measurement upon the common rule, you merely turn the rule over and it is in a position from which the scale measurements may be made.

The scale rule may now be marked. With one leg of your dividers at the center of shaft E as a center, transfer all the divisions from the common rule to the planed surface. With a sharp knife and small square cut into the scale rule the divisions thus found, in the manner customarily used upon rules. After the divisions have been cut, give the rule a coat of white shellac, allow it to dry, rub black lead into the cuts and apply another cut of shellac. The scale rule is now complete.

If the work has been performed accurately, the divisions on the scale rule will be found to be unequal, the distance between the divisions decreasing as the radius of the circle becomes larger. For instance, the first inch on the scale rule in reality measures 1-in. and 5/32, while the second one is only 1-in. and 3/32. The next step is the application of the rule to the making of cutters, or, if you set your machine by the pattern board, as you should do, to marking out the moulding on the pattern board.

Take any moulding you desire to make, and with a sharp pencil draw the exact shape on a piece of paper. At right angles to the base of moulding draw erect as many perpendicular lines as you may need—see Fig. 2. At the highest point of moulding draw the line A B parallel with the base line. Parallel to A B, and a short distance from it, draw line C D, Fig. 3. With the side of the rule containing the ordinary divisions measure from line A B to the deepest cut on moulding, which in Fig. 2 is ¾-in. and draw line E F; this marks the greatest depth of the cutter.

With your common rule measure each of the perpendicular lines from A B to the point of intersection with the circle of moulding. You will notice that the first measurement, the one already made, is ¾-in., the second 15/32-in., the third 19/64-in., the fourth 3/16-in., and the fifth 3/32-in.. Now with the scale rule, from the line E F, Fig. 3, measure upon the pro-

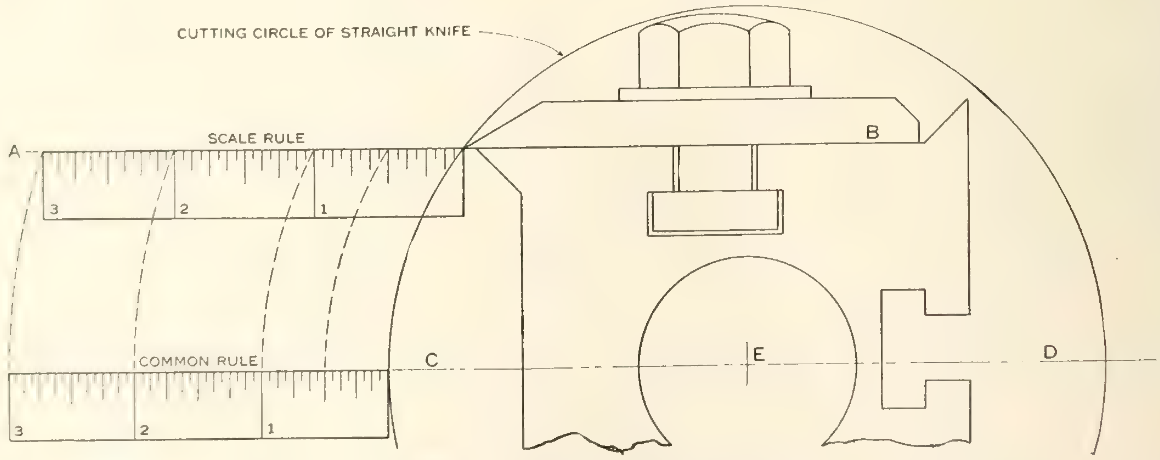


Fig. 1—Laying out Moulding Centres.

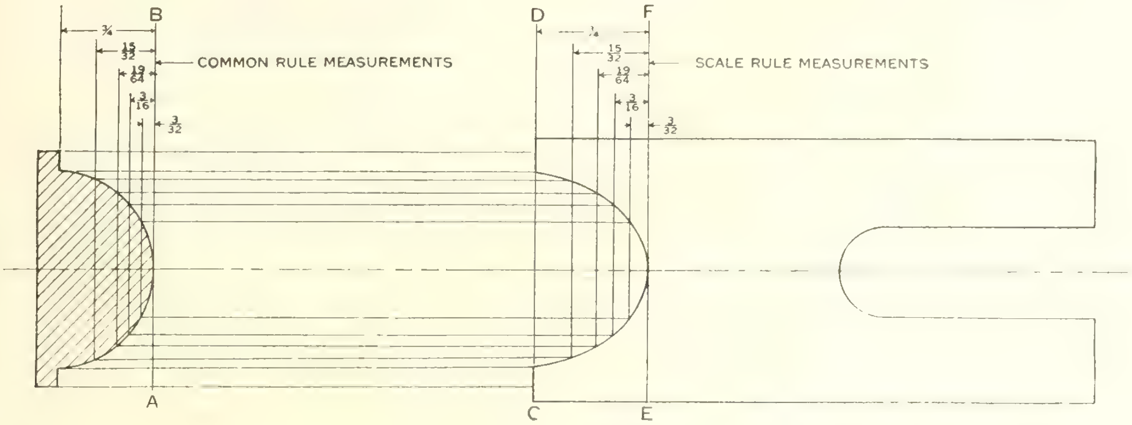


Fig. 2—Laying out Moulding Centres.

jected perpendicular lines in Fig. 3 the same measurements shown by the common rule on those lines in Fig. 2. A line traced through the points thus found gives the shape to grind the cutter.

The sketch contains many more lines than the actual work necessitates, but I have shown each step in detail in order that one unfamiliar with this method may readily comprehend it. If the size of the heads varies to any marked degree a rule will have to be made for each size. This same method is applicable to making shaper cutters, also to that bugbear of young cuttermakers, the cutters for the coping head of tenoning machines.

It sometimes happens that veneer joints open apparently without cause, after being placed in the press. The cause of the trouble generally will be found an excess of glue under the veneer. When the pressure is applied, this surplus glue follows the line of least resistance. That near the edges goes out of the edge, while that near the joint is apt to flow up through the joints. Once such a start is given, the veneer moves out pretty easily until all the surplus glue is squeezed out and the veneer settles on the core. It may easily be seen how easily veneer will slide when there is an excess of glue, by spreading some glue thickly on a board and moving another piece about on top of the glue, which will be gradually squeezed out at the sides till the two surfaces touch. Do not go to the other extreme, however, in remedying this trouble. A little glue should show on the edges after pressing just to make sure that the joint has not been robbed.

That brown wood is about to win popularity is the view expressed recently by certain writers who point out that with the use of Circassian walnut and figured gum on account of the brownish tone of the wood, and the fact of fumed effects in oak and other finishes of the same general character being preferred to the natural finish, apparently the public taste is inclining in the direction of browns. Expressing satisfaction on the prospect of such a change, a furniture manufacturer who has ordered black walnut for use in his fall lines said that "Walnut has a beautiful natural brown color which is distinctly pleasing, being rich without being ostentatious and attractive without being garish. We have had reds and yellows and blacks and now that we are taking up the brown there is hope for a stimulation of interest on the part of the public in the offerings of the furniture factories."

Spring Attachment for Jointer

A plain hand jointer may be made a great deal easier of operation, especially on material six feet or so in length, by fitting it with a couple of sticker springs. These are fixed through the fence, one on each side of the knives, so as to hold the material both before and after being cut. Naturally they would not be effective in taking the wind out of very crooked material, but for facing up lumber around the length mentioned they save a considerable amount of labor.

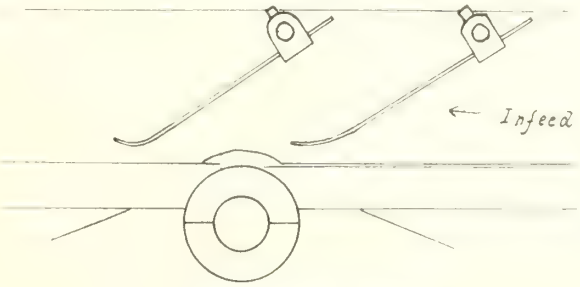


Fig 1—Springs applied to jointer.

For facing wide material two springs are nounted on the same bar as shown in Fig. 2, while one of these springs can be twisted sideways to hold it to the fence if necessary.

In having the springs fitted, unless the fence is fairly thick it is well to get sockets to screw on the back of the fence so as to give the bars sufficient hold to take the strain off the springs. Set screws in the sockets provide for the adjustment of the bars in or out according to the varying widths of stock.

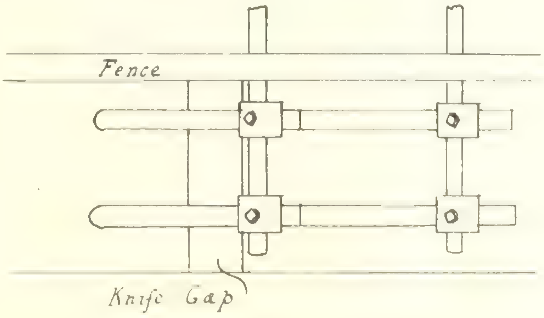


Fig. 2—Double springs for wide stock.

Expert Treatment of the Various Woods

THE beauty of wood is marred or enhanced by its treatment. What is more universally admired than properly finished wood, whether in furniture, woodwork, or floors? With such wonderful variety of grain, almost magically treated with modern stains and finishes, its natural beauty stands revealed. Each kind of its peculiar characteristics requires special treatment; in order to bring out this true beauty, not only the kind of finish, but also the color, must receive careful consideration by the painter.

So much depends upon the woodwork treatment in successful home decorating. Some woods are best adapted to stained effects, some especially suited to white enameling, while the greater degree of beauty is brought out in others by the natural varnished finish. Only the expert finisher can have a full knowledge of wood and its proper treatment; nevertheless, every home builder can and should be familiar with the kind of finish adaptable to the most widely used woods.

Oak

Because of its great durability and handsome grain, oak is perhaps the most popular wood for all kinds of interior trim. This wood is susceptible of a great variety of handsome effects by staining. It is found on all of the Continents of the Northern Hemisphere as well as at high altitudes just south of the equator.

Oak wood lends itself admirably to many styles of finishing. It is open grained, and when a varnished and rubbed or polished finish is desired, the pores of the wood must be filled and followed with various coats of varnish. When a mission or wax finish is desired, the filler is unnecessary. The natural finish, in which transparent filler and no stain are used, and the golden oak finish have been in use for a long period and are now rather commonplace.

The most popular shades in the stained oak are the fumed oak (a rich brown, light in tone), old English oak (a medium tone of rich brown, cathedral oak (a dark, reddish brown), early English oak (weathered brown in medium tones), the silver gray (light silvery effect); these effects are all easily procurable, and any or all of them can be treated in the rubbed, polished, mission or waxed finish.

Oak, on account of its open grain, can be treated in handcraft system effects, which consist of a stain, a first coater, and a color toner. The rich colors of this stain blend perfectly with the toner, which fills up the wood pores and forms an unusual effect. Oak wood has many peculiar qualities which demand stains of exact character and quality. It contains gallic acid, which attacks stains of unsuitable nature.

Chestnut

Chestnut is an open-grain wood, the pores of which require filling for varnish and rubbed effects. Being less expensive, it frequently displaces oak for interior woodwork. It is found in the temperate regions of Europe, Northern Africa, Eastern North America. The Northern American wood is better and, although easily worked, is extremely durable.

Chestnut can be treated practically the same as oak, although it is more frequently stained and finished natural. Silver gray (a silvery gray with bluish cast) or brown oak are particularly suitable for use on this wood. The rubbed, mission, waxed, and natural finishes can be obtained on chestnut, and the specifications are similar to those for oak.

Mahogany

Mahogany is one of our most beautiful and valuable woods for furniture and interior finish. Its decorative value is due to a combination of beauty, working qualities, and durability. Its beauty is influenced by its wonderful grain, particularly noticeable in "crotch mahogany," and also by its rich brown color. These qualities are greatly increased by proper staining.

Mahogany is an open-grained wood, and therefore, requires filling with mahogany paste filler. It is susceptible to the highest polish and is also very attractive when given a dull finish by rubbing the last varnish coat with pumicestone and water. The grain of crotch mahogany is caused by the crotches or junctures between branch and truck, and on account of its great value, is used largely as a veneer. Mahogany is a native tree of the West Indies and Central America, much of our supply coming from Mexico. The African field is the latest, and large quantities are now being distributed through English markets. This wood is occasionally treated in a natural finish. It darkens slightly with age, and this tendency should be taken into consideration when staining. A variety of shades in mahogany stain are demanded, and therefore, mahogany stains are provided in light, medium and dark.

Birch

This is a most popular wood for furniture and interior finish. It is heavy and strong. Its color is a very light reddish-brown, and it has a fine, compact grain, which is extremely beautiful. It is commonly stained walnut, cherry, or mahogany, to all of which stain lends itself admirably. Silver gray is a very attractive finish for birch. It can also be finished natural. As a foundation for white enamel effect, it is unsurpassed. Its light color and delicate grain make it suitable for this purpose. Birch is less expensive than oak, but superior in many ways.

Southern Pine

The principal difference between this wood and white pine is in the grain, which is more strongly marked in Southern pine. This wood is heavy, hard, strong and durable, becoming harder with age. It is close grained and does not require filling.

When stained, the beauty of this grain is greatly enhanced, and it now frequently displaces oak for interior trim. All brown stains are particularly attractive on Southern pine. The silvery grays are quite effective, although the yellow tones in this wood largely overcome the blue in a silver-gray stain. These stained effects are still more attractive when treated in mission or dull finish.

Southern pine is often finished in white enamel, although it is not the best wood for the purpose. Birch, whitewood, or poplar are much less liable to show yellow streaks. Southern pine, however, can be treated in white enamel when a sufficient number of the proper under-coatings are used. When this wood is full of pitch a first coat of shellac can be applied to good advantage.

White Pine

White pine is a tree very common in Northern United States and Canada. It reaches a good size in favorable soils, and furnishes a light, soft wood with close, straight grain, which does not require filling. Its color is a faint yellowish white, and its abundance, the ease with which it can be worked, and its power to hold glue, make its use very extensive. It is commonly finished natural, but will take any stain very satisfactorily. White pine is frequently used under white enamel, and is even more satisfactory for this purpose than yellow pine.

Whitewood—Poplar—Cottonwood

These trees are not related, but all have similar qualities and uses. They are frequently used for interior woodwork, woodenware, and paper pulp. The fact that these woods are all rather light in color and have no pronounced grain, makes them especially suitable for white enamel woodwork. They have less tendency to yellow streaking than yellow pine, although good under-coatings are essential. At the same time these woods can be finished natural satisfactorily. By staining whitewood mahogany, a fair representation is obtained because of the absence of strong grain.

Bird's-Eye Maple as a Cabinet Wood

THERE will always be a place in the mind of the furniture lover for bird's-eye maple. Its peculiar beauty lies in the fact that it is "different" from all other woods, and consequently of such character as to make it a continual source of admiration by lovers of the beautiful. The use of bird's-eye maple wood is centuries old. Long ago the Romans had a special liking for this lumber, and it was used for some pieces of furniture and was specially prized for its beauty.

But in those days, as now, it was scarce. It seems that there has never been more than a limited supply, and the sources, being few, seem to have had much to do with this condition. There were some rare specimens found in Istra and Boetia, and it was deemed of still greater value than the citrus, a highly valued wood. Today one finds it in England and America. In this country it is found in two states only, Wisconsin and Michigan, and then the supply is limited, so that the wood can only be used for the manufacture of veneers, for the greater part.

The trees grow in groups, many times only a few specimens being found in a given locality. In such instances, there might not be found other trees for a distance of forty acres. The bark is rough and the trees when they have attained a twenty-five year growth, are rarely more than two feet in diameter. The cutting is always done in the winter months, when the sap is down, and they are hauled to the log yards of the plants and permitted to lie in the open until the following spring.

The trees being straight, it is often possible to get a seven-foot veneer strip from many logs, and in this way it makes the beauty and the value of the stock more profitable to the veneer manufacturer. The trees are sorted as to their particular value, and the best only cut into veneers. The others are sawed into lumber for furniture, piano backs and kindred uses. The rotary cut is the only kind of veneer made from this stock, thicknesses being from one twenty-fourth of an inch to one twenty-eighth and one thirty-second. The grain of the stock varies as the saw divides the eyes transversely or longitudinally, making the wonderful effects that characterize this veneer as an ideal material.

The figured effects are made possible from the small curls, zones or spots in the log. The finished stock has little dots or sometimes ridges, and these are caused by little cones which are found on the logs, and are directly traceable to internal spines, or points in the bark. The wood is molded in layers upon these projections, and their fibers are curled in their respective places. When the log has been cut into veneers they are noted as prominent features, and are in reality the foundation for the veneer's beauty.

The short supply of stock of this character makes the industry limited, and there are very few lumber or veneer manufacturers featuring this line. The uses, always confined to a limited number, do not increase, as the supply of stock will not permit it, and the cost of the stock is also a prohibitive element that enters into the theme to a great degree.

In the spring the logs, which have now become well seasoned, are placed in steam boxes, and then cut into veneers. The stock is placed in the dry kiln and the selection is made according to quality. The fewer knots that are found in the stock, and the freedom from black streaks, makes the quality of the stock much superior to such as have these defects.

There are uses to which the less desirable stock is put, and much of this finds its way to the piano manufacturer who uses it in the manufacture of pin blocks for pianos. Other uses for this less desirable stock are interior finish and panels and kindred uses. The natural color of the bird's-eye maple has in the past few years given way to the many colored varieties that are found for the foregoing purposes. It has been found that this stock will readily take any color of dye, and that the finish will also be obtained that makes it a very striking factor for use on interiors.

The furniture manufacturer does not need this innovation for his commodities. The beautiful effects that are possible with the use of bird's-eye maple veneer for the finer grades of furniture, make it an ideal material in its natural state. There is a delicate and very artistic effect thus gained that makes it appeal to the housekeeper who is eager for the chaste effect that is not found in any other wood.

The mottled maple has something of the effect produced by the bird's-eye maple, but there is not the same peculiar effect that has been made possible with the spines or eyes. The roots of the common yew have also some very beautiful effects in this way. The common elm produces some pleasing and artistic effects for furniture, the latter being manufactured from the root and trunk of the tree, made possible by the continued stripping off of the side branches. The latter is a practice much in use.

However, there has been nothing that can quite replace the artistic effects made possible by the bird's-eye maple. It is, we might say, in a class by itself, and there will always be the same admiration for this stock, by the purchaser of a better grade of furniture, that has marked the industry for generations. It can not be imitated, and there is no substitute that can take its place. The delicate lines and the clean alluring effects made possible in this stock are not to be noted in others, though, of course, some of them are much more costly.

When a man figures out the amount of mill waste involved in doing a given work, he is really only accomplishing a part of his task. The other part consists in seeing how much this waste item can be reduced or turned to account in some way.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Q.—"Can you refer us to any kind of a loose pulley which will not demand the constant care and attention required by the ordinary kind?"

A.—It all depends upon what you want to invest. If you want to forget your loose pulleys for a month at a time, get them fitted with ball-bearing bushings. They will cost a lot more, but by the time you have had them in use for a year or so your saving in repairs, lost time and power will have wiped out the entire extra cost, and they will continue to run for many years if you don't let them go dry. If you cannot manage the price of ball-bearings use soft grease and suitable grease cups. If the pulley runs on a stud, place the cup on the end of the stud with a hole to the middle of the bearing as shown in Fig. 1. Make the usual grooves in the stud, but enlarge them a little to allow the grease to flow freely. If it is in the middle of a shaft, mount the pulley on a stationary bushing which is in turn mounted on the shaft, as in Fig. 2. The cup will be stationary and easily reached, while if it does go dry nothing will be damaged but the bushing which is easily replaced. Where bearings are within easy reach use plain cups. Where inaccessible, except when the power is off use Spring compression cups. Never expect a single grease hole and set of grooves to lubricate a bearing more than 4½ inches long. If the bearing is longer than that, put in two holes, which may be fed by the same cup.

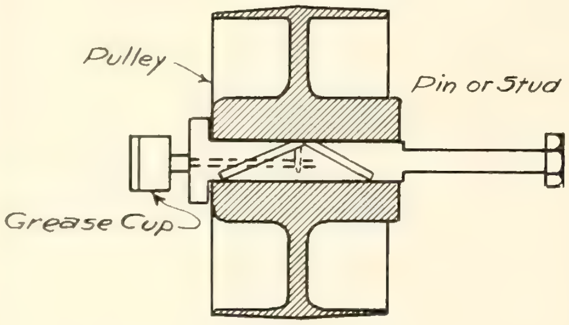


Fig. 1.

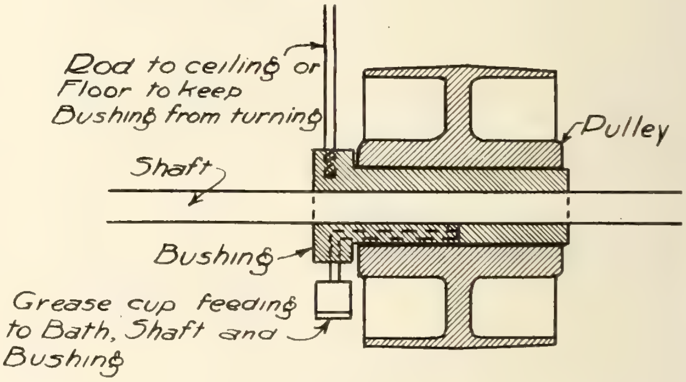

Rod to ceiling or Floor to keep Bushing from turning
Pulley
Shaft
Bushing
Grease cup feeding to Bath, Shaft and Bushing

Fig. 2.

Q.—"We operate a box factory turning out packing cases, mostly, and have been greatly puzzled at the apparent discrepancy between our figured and our actual waste. By careful measurement of various boxes and the lumber we use, we have decided that the total waste which should be added to our selling price is 18 per cent.; therefore after finding the quantity of lumber required for a certain lot of cases, we have added 18 per cent, but in actual practice, the lumber does not hold out and we are unable to locate our error."

A.—This matter of waste is such a broad one that it is rather difficult to cover the whole subject in a short paragraph, but perhaps the following will set you straight. You are correct in your method of ascertaining your waste in that you have measured your lumber, cut your boxes and measured what you had left, the part lost in shavings, sawdust, poor spots, etc., being the difference between what you started with and what you had left in boxes and usable lumber, or 18 per cent of what you had to start with. Now, however, when you figure your price, which is really the most important part, you say, for instance, that fifty cases actually contain 1,000 ft. of lumber. Your waste is 18 per cent, therefore you add 18 per cent of 1,000 ft. to the 1,000 ft. and get 1,180 ft., which at $30 a thousand feet is $35.40 or the total cost of your lumber. What you should say is this:—This lot of boxes actually takes 1,000 ft. of lumber. How much must I buy, allowing for 18 per cent waste and still have enough for the boxes? We will say that the total amount of lumber required, including waste, is represented by 100 per cent. We know we have to throw away 18 per cent of this, so by subtracting at once from the 100 per cent we have 82 per cent which will represent the amount actually required or 1,000 ft. Now if 82 per cent equals 1,000 ft., 1 per cent equals 1,000 ft. divided by 82 or 12.19 ft. and 100 per cent. will be 1,219 ft., or the total amount required, which at $30 amounts to $36.57. You will readily see that by figuring only $35.40 for lumber and then using $36.57 worth, you are making your customer a present of $1.17 with every 50 cases you make. By the time you have made a thousand of these you will have given him $23.40, and so on. A thousand cases is not a large output per day, while there are lots of us who would be well satisfied with the $23.40 clear profit which you are going to have as soon as you figure your waste properly and raise your price.

Q.—"We have a double surfacer, Berlin make, which we desire to locate in a shed where there are no facilities for hanging shafting. Can you suggest any way in which we can drive it by motor, so as to avoid

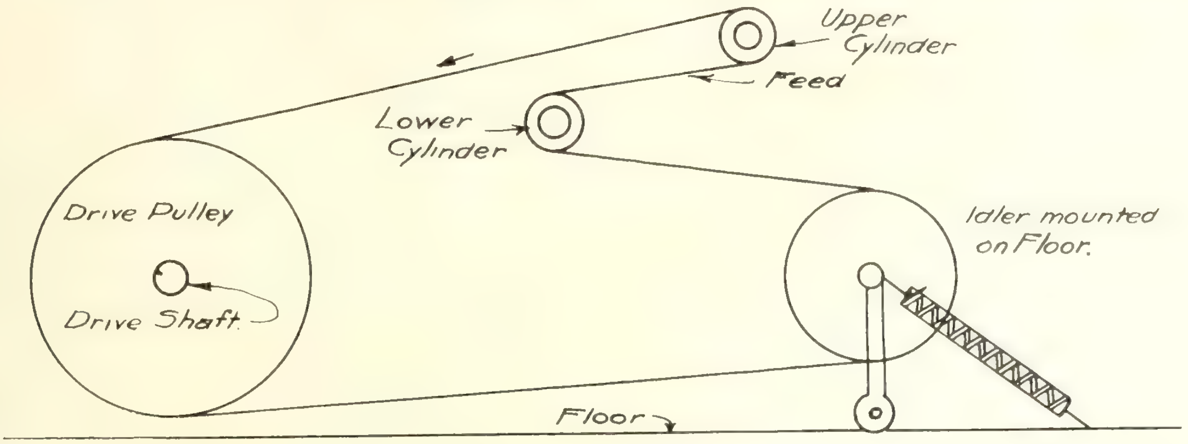


Fig. 3.—Above is belt plan for left side. On right side belt direct from drive pulley to upper cylinder. Set motor so as to belt to drive shaft.

the necessity of erecting scaffolding for the countershafts?"

A.—If you have the machine I think you have, it will have a shaft across the rear end carrying feed pulleys, etc., but if not, you can easily mount a shaft in two ordinary hangers, high enough to allow the drive pulleys which go with the machine to clear the floor. Fig. 3 shows the belting plan for both sides, and is self-explanatory. You will find the rig entirely satisfactory if you use cemented belts or a hinge wire lacing.

Q.—"As we have a number of small panels about 16 ins. square to glue up, out of ¾-inch birch, we would like to know of some method that will give us an advantage over our present one. Up till now we have been using straight hand cramps and putting four panels at a time in one pair of cramps. This method seems to give good results as far as actual glueing up goes, but we are inclined to think that the time consumed in piling the full cramps and picking them up again might be saved?"

A.—From the query it would appear that the work does not warrant a set of continuous rotary cramps, which are designed specially to overcome the time loss difficulty experienced with straight cramps. A useful substitute, however, can be made with two pieces of 1-in. pipe fixed vertically into a wooden base. Fig. 4 shows the general elevation of a cramp made on

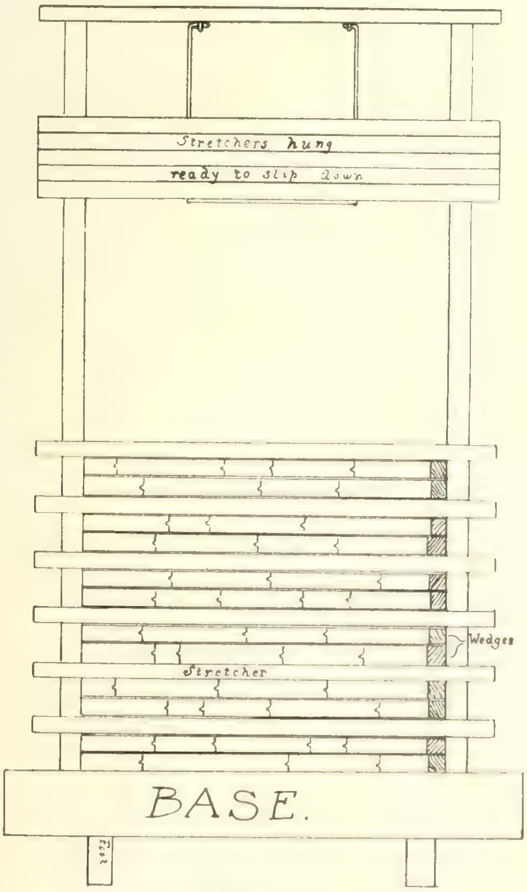


Fig. 4.—Cramp in use.

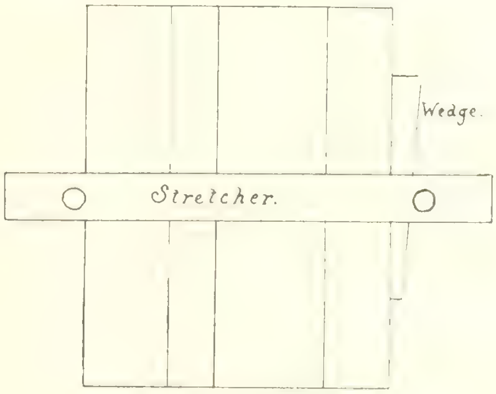


Fig. 4a.—For ordinary widths.

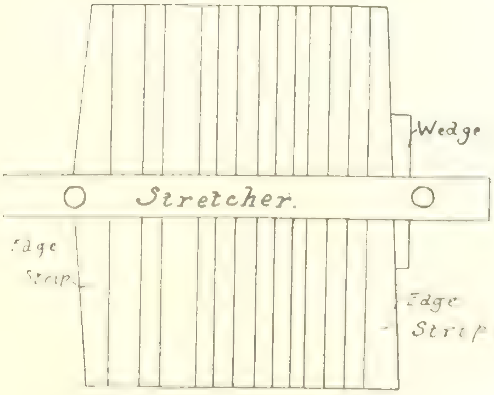


Fig. 4b.—Arranged for narrow stock.

these lines. The base should be made fairly heavy, a [illegible] hardwood block being suitable for this purpose. As the wedging up of the panels one above the other would tend to spread the vertical rods as the pile grew higher, and thus remove all the pressure on the lower tiers, stretchers have to be employed between each tier. These stretchers are bored to correspond with the base block, and when two tiers have been laid a stretcher is slipped down and the glued stock secured by wedges. As the top ends of the pipes are liable to spread a little it is best to put on all the stretchers required before commencing to wedge up, holding them out of the way by means of a wire hook and slipping down one at a time as required. For ordinary lumber it is sufficient to wedge up with the single wedge, but for narrow strips it is best to put on edge pieces in addition. These should be slightly concave on the inner edge to ensure sufficient pressure on the ends.

Combining Lathe and Scroll Work

FREQUENTLY a job comes to hand which, though on the whole regarded as lathe work, requires at the same time the use of the band saw. While the bulk of the work may be done in the lathe, there may be one or two features requiring a little scroll sawing. In fact, no small proportion of fancy designs in wood work consists of combinations of this kind.

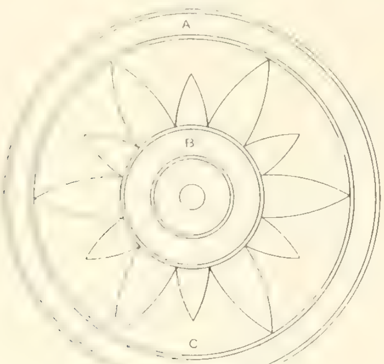


Fig. 1.

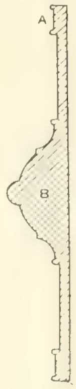


Fig. 2.

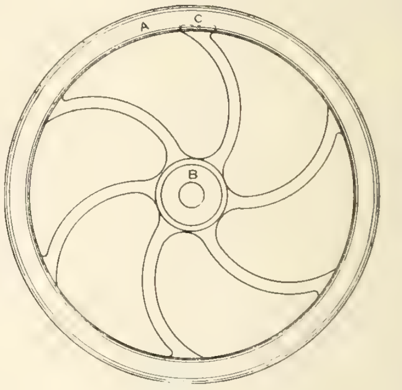


Fig. 3.

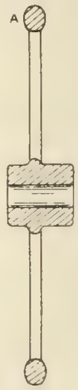


Fig. 4.

Fig. 1 shows a rosette design which, though of simple pattern, consists of a combination of both circular and scroll elements. The circular parts, such as the outer rim A and the center-piece B, must be worked out in the lathe, and present no more difficulty than any other ordinary turning. In Fig. 2, at A, the shape of the outer rim is shown, consisting of a flat surface flanked on either edge with a small bead to break up the plainness of the face. Outline of the center-piece is also given in Fig. 2, at B. On account of thickness this needs to be built of two or three layers of wood, all firmly fastened together by means of glue and allowed ample time to set. Then in the lathe it may be fashioned to size and shape as per blueprint.

With the turning parts out of the way, attention must next be given to the scroll design, which in this case is meant to represent petals. To do this a board will be required a trifle wider and longer than the inside diameter of the rim—C, Fig. 1—and ½-in. thick. If the diameter, as in this instance, happens to be 2-ft. in length, three or four boards will need to be jointed and glued together to produce a surface of the required size. After planing this large board to a uniform thickness, the petal design may be laid out on one face. This task, of course, requires no great skill, because the six large petals may be easily marked out in succession with a compass, set equal to the radius of the inside rim circle.

To lay out the smaller petals it is necessary to describe a smaller circle where the points of these are to lie, and with the new radius proceed as before. In addition to all this, another circle, equal in diameter to the center-piece, must be placed on the board, in order to help get it in the correct position. Having these preliminary details attended to, the board may be taken to the band saw and sawed out according to design. One should not hesitate to cut right close to the line, for in so doing he will dispense with all need of trimming with chisel. Indeed, if the saw is at all sharp, the cut will be so clean and smooth as to require no finishing except a little sanding.

With all the different parts gotten ready, the next step is the assembling. Usually this is done on a large, flat, smooth board, on which is tacked, temporarily, the rim, with the plain face down. Inside of this and fitting closely into it may be placed the scroll work, which should be fastened rigidly in position with glue and nails. Last of all, on the center of this scroll board the center-piece itself may be placed, the correct position being determined by the circle already described. After allowing ample time for glue to set, the rosette may be released from the board, given a few touches in the way of sanding and polishing, and the task will be completed.

Fig. 3 represents a wheel with six curved arms, in the production of which the two machines already mentioned must be used. The rim A, oval in shape, as shown at A, Fig. 4, must be turned in the lathe, being usually built up of two or three courses of segments to secure strength. In this instance it is made thick enough to finish off to 1½-in. The pieces required for the hub must also be fashioned in proper shape in the lathe, before being placed permanently in position. Then the large board out of which the arms are to be formed will need turning into proper thickness (in this case ¾-in.) and the edge to a circle whose diameter is ½-in. longer than the inside diameter of the rim. The reason for this is that the arms, when cut out and inserted in their places, will need to be notched into the rim for a depth of ¼-in. This is necessary to secure strength and rigidity to the finished wheel.

Next comes the marking off and sawing of the arms. For the purpose of marking, a circle will have to be described on the arm board, half way between the inside diameter of rim and outside edge of hub. With the radius of this circle the marking out of the arms may be done, with a little widening out toward the base, where arms come in touch with hub. This may also be done by compass and a little free-hand sketching. With these details out of the way, the next move is cutting out the notches—C, Fig. 3—to allow the insertion of arms into the rim, there to be fastened permanently in place. Then follows the construction of the hub from the pieces already turned for that purpose. Usually these are fastened in place with both glue and nails.

One step more needs mentioning, namely, the rounding off of arms by means of knife and spokeshave into a flat, oval shape, with the object of imparting to them a more finished and artistic appearance. This rounding work must be done all the way from hub to rim, in order to make the work look uniformly neat. Such a job as this is quite an undertaking and requires much painstaking labor; but when done, the workman feels well repaid for his efforts, in the sense of satisfaction it brings to his own mind.—Woodworker.

Attending to Small Details

WHEN I was a lad I was eager to be promoted from behind the saw bench to one of the machines, states Machine Woodworker in a contemporary. One day, to prove my abilities, I went to a frame that the frame-worker had left and started to put in some battens. The ribs of the frame were set for 9-in.; I knocked them down and put in the battens. The foreman was standing close by and watching me. I stood by the frame, looking very important, watching the saws as they cut their way down the battens. The frame was one with holding-down arms. The battens went along, and I fed two more in—put them in with the round side to the fence, and thought as I was doing so that "I am showing the foreman I can work a frame as well as any man."

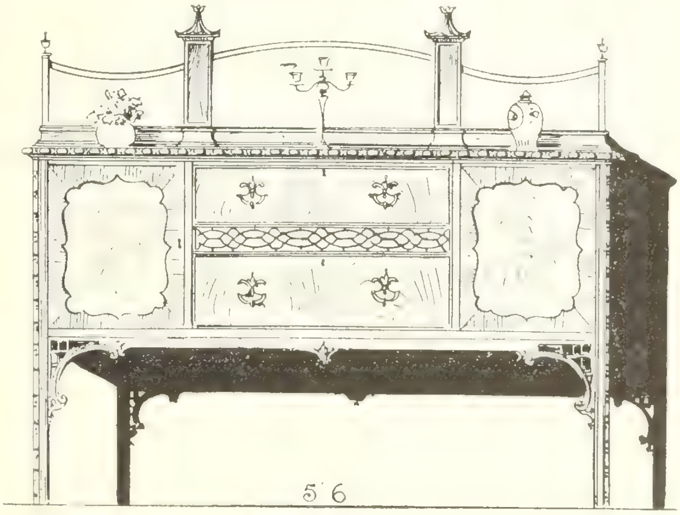
Everything would have been right, only I forgot about those holding-down bars. They had been set for 9-in., and I remembered them as soon as the battens left the binding rollers. The battens reminded me, too; they went up and down making a terrible clatter. There was 2-in. of space between the iron and the wood, and the battens lifted that amount each time the frame went up. The foreman picked up two blocks of wood and poked them under the holding-down bars, then when the battens were free from the saws threw the belt onto the loose pulley and told me to go and pull out for the sawyer.

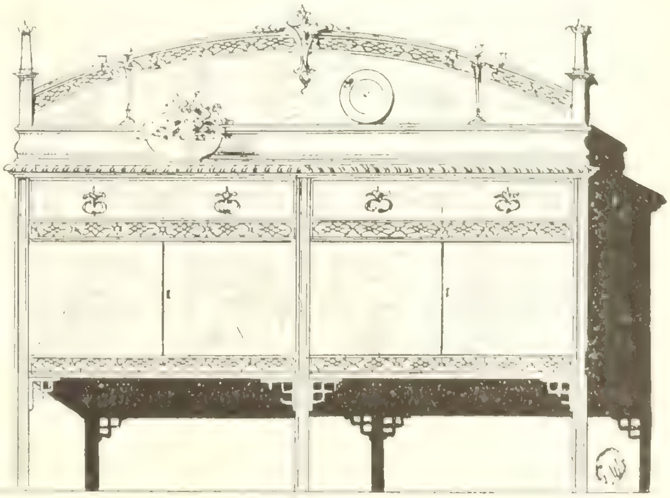
One little thing I neglected, and so the amount of prestige which I hoped to gain was forever lost. I expect he put me down as a simple-minded fool that did not know enough to get two battens out of a frame without smashing them. I knew that the bars should have been lowered, but was so intent on posing that I forgot to lower them. Many a little thing like that is sufficient to damn a youth, to make those over him think he is inattentive and cannot grasp the fundamental principles of different machines.

It was thinking about that incident that suggested this article on small details. When one comes to think about it all, it is attending to small details that makes up the art of every trade or craft, of knowing what is required and of doing it. The broad, general lines of every man's trade can be learned in a few days; it is the small details, the delicate attention to various operations, that makes the successful workman. More especially so is the art of attending to wood-working machinery. The various operations so differ, day by day, that it requires a good memory to know what to do. Where, for instance, the complication has not occurred before, then one's memory is of little use, and unless the person is a diligent reader, then experiments must be made, which will take time and which may not be successful.

Designs for Chippendale Sideboards

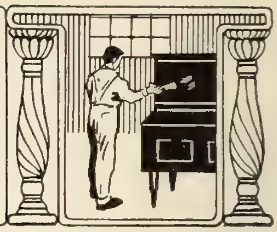
The designs reproduced herewith are for two Chippendale sideboards. The furniture is in mahogany, the finishing being done in antique color styles, cross-grained, with drawer fronts and panels wrought in curl veneer. The handles are finished in oxidized silver and make an exceedingly fine effect. In the 6-ft. board shown in the illustrations, a platform six inches deep is introduced under a wood back. The rail back, which is made from a board 5 ft. 6 in. in length, is an effective combination of wood and brass. The satin finish is a feature of these examples which should prove attractive to furniture manufacturers.





The man that has the most hard luck with saws that come to the filing room should be the one to develop the best skill, for it is hard work that makes and tries strength.

THE FINISHING ROOM



The Varnish Drying Problem

THE great problem before the finishing-room to-day, and which because of its vast importance, calls loudly for a solution, is: What is the best method for drying varnish? The question is a very complicated one, made so by the various interests involved. There is the question of the effect upon the veneer in the case of built-up stock, and the question of the effect upon the glue in both solid and veneered work. In order to thoroughly solve the problem presented by the demand for a more rapid system of drying varnish, we must first understand what drying varnish really is, or, in the language of the schools, we must understand the philosophy of it.

The drying of varnish is not so much a mechanical as a chemical process, although it is necessary to have proper mechanical operations in order to facilitate the chemical operations. The drying of wood is more mechanical than chemical. A rise in temperature vaporizes the moisture in the wood, and this vapor either rises owing to its being lighter than the surrounding air, or is carried off by the passing air. In the drying of varnish the same mechanical operations are necessary in order to convey to the varnish the necessary elements to promote the drying or hardening process. There is very little evaporation in the process of drying varnish, especially of a turpentine varnish. If varnish contains a considerable quantity of benzine, that will all evaporate, but where the ingredients are vegetable products, such as turpentine and linseed oil, the process is one of oxidation and not evaporation.

Varnish, in the process of hardening, consumes large quantities of oxygen and throws off small quantities of hydrogen gas, and it consumes the oxygen more rapidly in a high than in a low temperature. Varnish will harden under normal conditions of temperature, etc., but the process will be very slow. The air will come in contact with the varnish, the varnish will extract the oxygen and consume it, and the air, which has been depleted of oxygen, has in consequence changed its weight and moves out of the way, carrying with it the hydrogen gas which the varnish has thrown off, and, when it moves away, other air takes its place. Now, this process will continue ceaselessly in a temperature of 65-deg. F., every minute of the day, but it does it very slowly.

If we want to change the speed we simply change the conditions that are essential to the hardening process. The hardening process is practically at a standstill in a temperature of 50 deg. F., so that if we wish to cut in two the time required for hardening, we simply raise the temperature from 65 deg. F. to 80 deg. F., double the supply of oxygen by increasing the quantity of fresh air admitted and increasing the circulation of air. Under ordinary conditions, where the stock is sufficiently far apart to allow a free circulation between parts, the ventilation necessary to supply the required amount of fresh air will keep up a sufficient circulation without making it necessary to resort to artificial means. Whatever percentage it is desired to increase the speed of hardening, all that is required is to increase the facilities in proportion. Raise the temperature, increase the supply of fresh air and keep up the circulation.

Having outlined the principles which govern the hardening of varnish, we are in a position to discuss the means by which the hardening can best be promoted in order to decrease the time required. Very few factories care to set up a separate drying room apart from the varnish room. There are various reasons for that, and the chief one is that there is very little advantage in doing so. Varnish applied in a temperature of 70 deg. F. ought not to be put at once into a temperature of 100 or 120 deg. F. It ought to be allowed to congeal before going to a very high temperature and this will take from one to three hours. I take it that the average shop would prefer to convert the varnish room into a drying room at night, provided the shop could be brought to the proper temperature for the men to start work in the morning, and this can easily be done.

The first thing required is an auxiliary heating system or an addition to the one already in use. This should be of sufficient capacity to raise the temperature to 100 deg. F. in very cold weather. But a system that will hold the temperature of the varnish room at 70 when the mercury registers 20 below zero outside will not need to be augmented to any very great extent, although some slight addition will be necessary.

The next thing is ventilation. Provision must be made for allowing the fresh air to enter and the foul air to escape. This is no time to talk about "heating the whole town," as some men are so fond of doing when one talks to them about ventilation. We must have fresh air and we must get it from the outside; and we must get rid of the stale air and we must put it outside, even if it does heat the whole town. We are not putting it out to heat the town; we are putting it out because it is worse than useless inside.

In ventilating, the means for both the ingress and egress of the air should be at the top of the room. By entering at the top the cold air will more readily diffuse itself throughout the whole room and will not be so liable to come in contact with the varnish before it has risen to the proper temperature. To let the foul air escape it would be well to have ventilators in the roof, while the fresh air may be admitted by lowering the windows at the top. Of course, either the side or the top will furnish the means for both ingress and egress itself, but it would be better to use both.

So far we have heat, fresh air and provision for the escape of foul air. These are the ideal conditions for the drying of varnish. When the workmen leave the room at night, most of the varnish is in ideal condition for being subjected to high temperature, and as the rise in temperature should be gradual, the varnish that was applied just before quitting time will have set sufficiently to be beyond danger before the temperature reaches the danger point. The means of ventilation should not be opened suddenly, but should be opened gradually as the temperature is raised until a maximum of temperature and ventilation has been reached. In this way the temperature of the room may be safely raised to 120 deg. F.

Now this same varnish room must be put in shape for men to enter and work by starting time in the morning. This can be done by the use of a fan, the power of which must be governed by the size of the room to be cleared out. The fan should be located near the ceiling at one end of the room. A pipe 12 or 15-in. in diameter should extend from the fan along the center of the room, near the ceiling, to the farther end of the room. At intervals of every 6 or 8 ft. along this pipe, on the upper side, holes should be cut. These holes should be of various sizes; the largest, say 4-in. in diameter, should be near the end farthest from the fan, and decrease in size as they approach the fan, until the one nearest is not more than 2-in. in diameter. The power of the fan will be greatest close to itself, hence the reason for having a graded size of holes. There is always a certain amount of foul air, which, being heavier than the rest, accumulates near the floor. This cannot very well be drawn off from above, and some provision must be made for drawing it off from below. In order to do this 4-in. pipes should be run up the side of the wall from the floor to the ceiling, then along the ceiling, and connected with the main pipe that runs from the fan to the other end of the room. These pipes should be placed on each side wall at intervals of about 25 ft.

When it is desired to clear the room and lower the temperature for the workmen, close the ventilators in the ceiling and leave those in the wall (windows) open at the top. The length of time required to change the air will depend on the capacity of the fan and the speed at which it is run. But it would be well to lower it slowly, say at the rate of about 25 deg. an hour, until the proper temperature for working has been reached. This will allow the stock to adjust itself, without injury, to the changed conditions. When the fan is first started to clear out the room it would be well to keep the heat on full force. Let it remain on until the temperature is within 10 deg. of normal, then close off the auxiliary, leaving only the day system on. With this method the varnish room contains all fresh air when the workmen arrive in the morning, and is, therefore, in the very best possible condition—much better than could possibly be had under ordinary conditions.

One other advantage which this plan has over ordinary drying rooms is that the stock, when removed, is not subject to sudden changes of temperature, such as would be the case were stock removed from the drying room to the work rooms, unless the temperature were lowered specially for that purpose; neither is the stock taken suddenly into the high temperature, but every change is made gradually.—Thomas Wilde in Veneers.

Humidity and Drying Conditions

WITH the approach of the warm summer months, when the atmosphere is normally heavy and very humid, the writer of this article believes that varnish users generally, and furniture manufacturers especially, will be interested in the question of humidity as related to good varnish-drying conditions. It is a question which, by reason of its bearing on the maintaining of standard economical finishing schedules to produce the same excellence of finish, and its relation to finishing difficulties, should be thoroughly understood by every manufacturer using stain, filler, shellac or varnish on his product, as it is of vital importance.

It is a well-known fact that varnish users experience more difficulty in producing the desired results during the summer than at any other time in the year, especially as regards the drying of finishing materials from stain to finishing coat of varnish. The importance of this is appreciated when one considers the results that will follow when any undercoat of stain, filler or varnish is not thoroughy dry when the following coat is applied. On a damp, humid day, the grain of the wood raises very perceptibly as compared with a clear, dry day, making the surface to be coated very uneven and destroying much of the effect of fine sanding, thus starting the finish under a disadvantage. Stains and fillers will not dry as well as under favorable conditions, and especially when oil stains are used the filler is likely to cut into the stain, producing a mushy condition in the filler. If followed by the first coat of varnish on regular schedule, the varnish will have a similar tendency to cut into the filler, causing in turn a mushy coat of varnish, which will not dry hard and firm as under favorable conditions, and this condition will prevail through all coats to the finishing coat of varnish. As a final result, none of the coats being as hard as under good conditions, the finish is comparatively soft; a polishing varnish will not take as bright a polish and will rub and polish harder; gloss, rubbed or polished work will often develop sticking or printing troubles, and at a later date the gradual drying of these mushy undercoats will draw in the finish coats producing loss of luster and finish, or shrinkage. During such conditions the finishing materials are usually blamed for the disruption of finish or finishing schedules, when the drying condition of the atmosphere is the sole cause.

Conditions of Humidity

This condition is based on the scientific fact that the capacity of warm or hot air to carry humidity or moisture is enormously greater than that of cold air. For instance, air at 60 degrees Fahrenheit is completely saturated when it carries 4.8 grains of moisture per cubic foot, whereas, air at 100 degrees Fahrenheit requires 19.8 grains of moisture per cubic foot to saturate it. Thus, although the temperature has been increased from 60 to 100 degrees, or 66 2-3 per cent, its capacity for moisture has been increased from 4.8 grains to 19.8 grains per cubic foot, or 412.5 per cent.

Humidity is expressed relatively in terms of per cent of saturation, which is 100 per cent. Air at 100 degrees with 40 per cent humidity carries 7.8 grains of moisture per cubic foot, which is 40 per cent of 19.8 grains, the saturation or dew point.

Practical experience indicates that the best drying condition of the atmosphere at any temperature is with humidity of 35 to 45 per cent, although satisfactory re [illegible] have been secured at both higher and lower percentages. With a low humidity, however, there is a tendency to top-dry or case-harden, especially at a temperature above 100 degrees. With a high percentage the effect is to retard the oxidation or drying of varnish. Humidity is determined by means of a hygrodeik, or "wet and dry bulb thermometer."

The atmosphere normally has an average humidity of 60 to 70 per cent. When the percentage increases, due to natural causes, it often reaches saturation or 100 per cent, at which point the excess is precipitated in the form of rain.

In the cool months of the year, the outside air being at a low temperature, carries a very small amount of moisture, as described above. In this condition, it is brought into the factory or finishing-room and heated to 75 to 90 degrees, the result being that its capacity for carrying moisture, having thus been increased by raising its temperature, the percentage of humidity is lowered to anywhere from 25 per cent to 40 per cent, depending upon the temperature and humidity condition of the outside air. This is a very desirable condition for drying varnish and other finishing materials.

During the warm months, the condition is just the reverse. The outside air being hot, carries a relatively large amount of moisture per cubic foot, as described above. It is brought into the finishing-room at the same temperature and in the same condition, and as the temperature generally falls at night, its percentage of humidity is thus further increased, producing an extremely bad drying condition, which is likely to produce the results that have been described.

If the manufacturer would heat his finishing-room to 100 to 110 degrees at night during the hot months, as well as during the cold weather, and make suitable provision for constant circulation of fresh air and removal of foul air, this bad situation would be corrected and an excellent drying condition produced. This can be accomplished by placing the heating coils or hot air pipes along the outside walls underneath the windows, and having ventilators take air from the center of the room and extend down to within a few inches of the floor. Hot blast pipes or heating coils should not be near the top or center of the room, as such a location of the heating pipes or coils will prevent good circulation and increase the expense of heating. The heat should be turned off at three or four o'clock in the morning to allow the room to cool off and the filler or varnish to harden before the workmen commence work for the day. Suppose the outside atmosphere was 80 degrees with a humidity of 85 per cent, which would be a very hot, muggy day and an extremely bad drying atmosphere. By raising the temperature of the finishing-room to 100 degrees at night, the percentage of humidity would be thereby reduced to 46 per cent, which is considered an excellent drying condition.

The recent widespread interest amongst piano and furniture manufacturers in the so-called varnish dry kilns or drying systems, has been productive of great good in promoting a better understanding of this question by reason of study and experimental work toward reaching constant ideal drying conditions and reducing finishing schedules to the shortest time consistent with the best results, and is a subject which will be further developed toward perfection in the opinion of those who have given it the attention it deserves.

It has been found that many of the enthusiastic first claims, especially as regards the time in which work can be recoated, were not borne out in practical use of the so-called varnish drying systems or ovens, but the step forward toward the correction of lack of uniform drying conditions has been of sufficient value to the cause in general to offset minor shortcomings.

The writer's opinion, based on experimental and practical work along this line, is that only in those systems in which the three vital elements in varnish drying (1) constant circulation of fresh air (which means the continual presence of the drying agent—oxygen), (2) heat, (3) humidity—are present and under automatic control at the will of the operator, has the question been handled to the best possible advantage.

It is generally accepted as a result of practical operation that the temperature should at no time exceed 120 degrees, it being understood that the humidity should be at a desirable point and under control, and in the presence of continual circulation of fresh air, without a direct draft on the work. The writer knows of cases, however, where work run through an "oven" on an over-night schedule at a temperature not to exceed 96 degrees, in the presence of good, fresh air circulation and proper humidity, seemed just as dry and rubbed as well on a rubbing machine as work under the same schedule and the same humidity and circulation condition at a temperature of 118 to 120 degrees. This fact tends to clinch the argument in favor of conditioning the entire room.

Further, it has been proven beyond doubt that there is a limit to the time in which work can be coated, dried in a varnish drying system and recoated, with best results. It has been conclusively shown in practical shop operation, too, that as a general proposition, the varnish that gives the best results under the old air drying schedules will give the best results in use in a varnish drying system.

Conditioning the Entire Room

The writer believes that as a result of his study and experimental and practical experience along this line, both as a manufacturer of furniture and a manufacturer of varnish, that for the average finishing-room, there is nothing that will give the desired results better than conditioning the entire finishing-room, thus making the entire room practically a varnish drying room. By this he means making provision in radiation for raising the temperature to 100 to 110 degrees every night during the year and providing adequate means for a constant circulation of fresh air, which can be done by the proper ventilators, or a fan, or both. Such an arrangement is both practical and economical in the majority of shops, and in any event the manufacturer should provide for and have heat in his finishing-room every night the year round, for reasons which have been explained. This feature cannot be too strongly emphasized.

The benefit to be gained by the use of a suitable so-called varnish drying oven, or by conditioning the finishing-room, is such control of the elements as will result in the most desirable condition for the drying of varnish and finishing materials, to the extent that such a condition is produced and constantly maintained, rather than the extreme hastening of finishing schedules according to some of the claims that have been made, which have resulted to the detriment of the finish when followed. It is fully understood, however, that a suitable varnish oven, or a conditioned room, will turn out work in much shorter time than under ordinary air drying conditions which are continually changing.

The user of varnish who reads this article, studies out the problem along the lines suggested above, and applies it to his own finishing-room, will make an improvement in his drying conditions which will go a long way toward the result desired, viz., a perfect finish on his work.—The Furniture Manufacturer and Artisan.

Finishing Hardwood Doors

THE natural finishing of hardwood doors, exterior, is not at all satisfactory from the painter's standpoint, for it is very difficult to get a varnish that will stand for any extended length of time, the varnish, even of the high grade kind, sometimes breaking down within a few months. Here is a method recently given by a Canadian master finisher: Apply a coat of hot raw linseed oil as a primer; follow this with several more coats of raw oil applied cold and well rubbed in. In the first of these coats add a little turpentine, which will assist the oil to penetrate. Be sure to leave no oil on the surface of the wood, but rub all off clean. When dry apply a coat or two of raw oil with some waste or a rag, leaving some oil this time on the surface. This treatment is claimed to give better wear than any varnish coat. The method has long been advocated and practiced by painters or grainers for painted or grained doors exterior. The finish may be brightened up with oil at any time, and the soft, dull

(Continued on page 42.)

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

"50"
FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and does not show brush marks.

R. C. Jamieson & Co., Ltd.
Established 1858
Montreal Vancouver

Owning and operating P. D. Dods & Co., Limited

OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

(Finishing Hardwood Doors—Cont'd.)

effect is very pleasing. Of course this treatment will ensure almost perfect wear.

In no case should an outside door of hardwood be varnished and rubbed to a polish or without lustre, for the rubbing will seriously affect the durability of the varnish by removing its protecting film of oil, and so permit the entrance of moisture to the foundation, causing speedy decay of the varnish coat.

One of the worst troubles the painter meets with in the exterior door of hardwood with natural finish is the stains caused by water. These are almost impossible of removal, even by oxalic acid, the sure cure for stains in most cases. Where these stains do occur the only thing to do is to scrape down to the bare wood and then apply the acid, strong as possible, which may remove the traces of stain left. The work, if deftly done, may not show any traces, but usually it is best to remove the varnish from the entire surface and do the door all over, from the bare wood. In this case it is usually as advantage to slightly color some oil and rub it well into the wood, even though it has been paste filled, for this will import a uniform color to the wood and avoid spottiness, which appears after cleaning off. After this the surface may be well rubbed with curled hair or burlap, to remove any grit, and then be revarnished and finished.

Crotch veneer is recognized as among the most difficult to lay because it is cut cross-grain. The usual method of preparing it is to moisten slightly and then place between warm cauls, not hot, to flatten out carefully. Then some use what they call a dope or sizing. Most sizing material consists of a thin glue with perhaps other additions which are generally secret and so much mystery made out of it that it is difficult to give specific light about it. One of the best veneering authorities in the country, however, insists that nine-tenths of the trouble with crotch veneer lies in the finish, which is often done too rapidly and which involves the use of moisture at times. To get the best results one should strive to use other than water stains in finishing and anyway give plenty of time for thorough drying out in the process of applying the finish between the different coats. This authority approves the idea of sizing or coating crotch veneer with a thin glue solution that will solidify the end wood and after drying will prevent its taking up too much glue and moisture in the gluing and swelling. Crotch veneer should never be laid directly on to a solid core body, but should have a thin, smooth cross banding underneath. Then take time to let the work dry thoroughly before you start to finishing, and allow plenty of time between the different steps of the process and the result will generally be satisfactory.

A recent inquiry at the office of the High Commissioner for Canada, 17 Victoria Street, London, Eng., was from a Capetown man, who desires to be placed in touch with Canadian manufacturers of church, school, hall and office furniture prepared to undertake export business. Another was from a manufacturers' agent at Toronto desirous of getting into touch with British firms making a waterproof glue for use in the manufacture of hockey sticks.

There is a pretty close relation between knowledge and work—one is not worth much without the other.

D. H. R. ENAMELS

"The practice of saving time will lead to the saving of money and the beginning of all wealth is the saving of the small amounts."

Efficiency is another name for time saved in accomplishing certain results whether it be running a railroad, building a bridge or finishing a piece of furniture.

The time alone saved in finishing with

CAMEO UNDERCOAT and SAMURAI CABINET ENAMEL

would make it worth while, but when you consider the greater covering body, superiority of finish, absolute uniformity and durability of D.H.R. Finishes it is but natural that they have come to be recognized as the standard of the entire furniture trade.

In full Gloss or Matte Finish. For Brush or Spray.

Our New Shades will be Sent on Request.

Denny, Hilborn & Rosenbach
PHILADELPHIA, PA.

Oil Soluble Stain Powders

Try our latest and best production.
A perfectly Oil Soluble

Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Walter K. Schmidt Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

THE GLUE BOOK

WHAT IT CONTAINS

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
Nicholls Building, Toronto

A Better, Finer Finish at a Lower Cost

With the Aeron System
Guaranteed
Paints With Air

which applies first coaters, enamels and varnishes—thereby removing the inefficient, unsatisfactory hand brush from the finishing room, a smooth and uniform surface is always obtained. There are no brush marks, no thin spots, no sags, no runs and no fatty edges. Every article of furniture comes from your factory perfect in finish—a finish that cannot possibly be produced in any other way than with the AERON SYSTEM.

Along with this marked improvement in finish, there is a surprisingly big saving in time and labor. In AERONING, there is no lost motion, one man accomplishing as much as 2 to 8 with a brush—doing better work—effecting a saving of 25 to 90 per cent.

SIMPLE IN OPERATION The AERON will instantly and accurately respond to the operator's every inclination—will meet every requirement. No matter how irregular or rough the surface may be, or how difficult of access the places are, the AERON finishes smoothly and readily. The complete equipment and service is installed on a guaranteed basis.

PROVED RESULTS The AERON SYSTEM is used in hundreds of furniture finishing rooms, and is faithfully and successfully performing its every function. These manufacturers receive daily proof, in the form of savings and better work, of the merit, the economy, the efficiency of the AERON—our claims are based on these actual and regular performances of the machine.

A Post Card request from you will bring
AERON Catalog and AERON Detailed Information BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr Street, Toledo, Ohio

Veneers AND Panels

The Art of Vneeer Inlaying

THE art of inlaying was practised as early as the eighth and tenth centuries. Beautiful specimens from that time can be seen in European museums, the skill and workmanship of which show conclusively that at that early time great proficiency had been attained. "About the thirteenth century in Italy and the fifteenth in France some very beautiful creations were brought forth through their respective masters, Francesco, Boulle and Riesener."

Marquetry consists of two general classes, namely, ornamental and pictorial inlays. The first is composed of fancy scrolls, vases, leaves, etc., carried out in the different styles of ornamentation. Geometrical inlays, which are made-up squares, diamonds, triangles, circles, etc., so arranged as to form different designs, can be classed under this head. Pictorial inlays consist of faces, figures, animals and landscapes. The method of manufacture is the same in each case. I will now take up in detail the different steps in the process of making an ornamental inlay.

A suitable design is drawn on tracing paper, or any strong thin paper. In drawing, care should be taken to see that the different pieces of the ornament are separated; that is to say, that the design is not to be made in one piece, as, of course, you desire to use more than one variety of wood. Another sheet of paper, preferably bond paper, is then placed under the sketch; thumb tacks are used to hold these two sheets in place on a softwood board. Perforations are then made through both sheets; that is, very small holes are made through the papers, following the lines and every minute curve; a celluloid scroll or curve is used to guide the hand. This under-sheet of bond paper is termed the pattern. The pattern is clamped firmly to a table, print paper being placed under it; a fine indelible powder is then brushed through the holes of pattern, making a duplicate of the design. The advantage of this pattern is that any number of prints or duplicates can be made, and they will all be exactly alike. Sufficient prints are nade to enable you to cut out each unit or piece representing a separate and complete part of the design. A small scissors or knife is used to cut out the different parts of the print; the knife, I think, is preferable. These pieces are now ready to be glued on the different blocks of veneers, which we will take up later.

The veneers used are generally 1/24-in. thick, and are selected for their beauty of color and figure. In an ornamental design, box, pear, satin, white holly, amaranth, ebony, cherry, tulip, prima verra, kyonyx, amboyne and silver maple are the woods most generally used. However, all these woods are not necessary. Satin and pear alone make a very pleasing combination, when a little shading is used, the shading being accomplished by dipping the piece to be shaded in hot sand.

The prints representing the different parts of the design that were cut out of the duplicate are now glued on their respective blocks. By blocks I mean the veneers are nailed up in blocks of ten or the quantity desired; ten is the general nunber, however. More can be cut, but the pieces fit with more accuracy when the blocks contain the average number. These pieces, after being cut, are termed the "filling." Holes are bored around each piece, in which nails are driven: just enough nails are used to make the block solid. The nails used are ¾ or 1-in., 20-gauge, flat-head, the length of nail depending on the thickness of the block. Before nailing, a piece of birch or common veneer is placed under the block. This is called "backing." The points of nails protruding through this backing are nipped off and filed smooth, and the blocks are ready to be sawed.

The saw used may be either a machine jig saw or a band scroll saw; of course, the jig saw gives better results. The saw blade used for ordinary work has about thirteen teeth to the inch. Directions can hardly be given for sawing, as it is a matter of practice. I might add, however, that better results are obtained when the block is held lightly, without a cramped grip of the hands. The veneer that the different pieces of filling fit into is termed the "ground veneer." The ground veneer is prepared by gluing on this block the entire print or duplicate of the design. The veneers are blocked similar to the "filling." However, the nails are placed on the inside of the lines—that is, on the part that cuts out. A square is cut out of the ground veneer, into which the filling fits. (The nails were placed in square that was cut out.) When a very close fit is desired, half of the line is left on the filling and half on the ground.

Inlaying

About the only tools needed in inlaying are a magnetized hammer, a small wood-carving knife (a pocket knife does very well), a small pair of tweezers, used in handling very small pieces, and a pair of nippers used in pulling out nails.

The ground veneers, after being sawed, are taken apart by removing the nails, which should always be placed near the edge, to keep them from shifting while sawing. One of them is now placed on a smooth table or caul, and a few brads, ½-in., 22-gauge, are tacked in to keep it flat on table. The different pieces of filling are then set in the ground in their respective places. When the pieces are large they are taken in the fingers, and, when real small, the tweezers or point of knife are used. Brads are sometimes placed in the filling if the wood is dark, or in a corner where it will not show. After the inlaying is completed, a piece of paper is glued over the entire ornament and ground and brushed down until it adheres firmly to the veneer. This paper is for the purpose of holding the filling in the ground until it may be mounted or glued on the core, panel or whatever it may be intended for.

When this has stood about ten minutes, the nails are removed from the inlay with a pair of nippers; it is then looked over carefully and placed under pressure for about one-half to three-quarters of an hour.

After pressing, the inlay is again looked over, as oftentimes little points are missing, and these should be replaced. The inlay is now ready to be filled, which is done by rubbing a composition of very thin glue, whiting, sawdust and coloring matter, with the hand, over the inlay, filling all openings. The filler is scraped off with a wide blade scraper, pressing downward so as to force the filler in. A neutral color of filler is generally used. Before mounting or gluing on the panel or core, the inlay should be allowed to dry about six to eight hours and kept flat while drying.

The mounting of an inlaid veneer is done the same as a plain piece of veneer. Of course, the side that has been filled is placed down and the paper side up. After the inlays have been glued and dried for two or three days, the paper may be cleaned off. For cleaning, a belt sander is best; but, if done by hand, a scraper and sandpaper are used. However, before finishing, ample time should be allowed for drying the panels to prevent warping. The finishing is done the same as any other veneer work.

The ways in which ornamental inlays are used are varied and many, the field being very large. They are extensively used on all styles of furniture; the backs, legs, arms and rails of chairs and sofas offer a suitable place to apply this product, with the result that the beauty and value of such articles are greatly enhanced. Table tops, bookcases, desks, etc., are more or less inlaid, according to the lines on which they are made. Clock dials are inlaid with metal numerals, which have an advantage in that they present a flush, even surface. A number of piano firms are having their top and bottom piano frames inlaid, either with a fancy scroll design, an ornamental landscape, or with a three or five-ply line inlay.

Inlaid work is used in interior decoration for friezes, door-casings, panel wainscoting, columns, floors, etc. Hotel doors are inlaid with the room number and a crest or coat of arms. Office and store fixtures are often inlaid with a small ornament and a three or five-ply line. Flush veneered doors for dwellings, office buildings, etc., are inlaid with a double line around the outside, with an appropriate ornament in the center. Musical instruments, especially the guardplates and fingerboards of mandolins and guitars, are extensively inlaid with pearl, ivory, metal, tortoise shell and wood. As an advertising medium for firms dealing in veneers this product ranks among the first. The dealer's name is inlaid in a landscape or other suitable design, made up of the woods which he makes a specialty of handling. These are distributed to his customers and offer a very striking and beautiful office ornament.

This practically concludes the more important uses of ornamental marquetry. However, it is being put to new uses every day, and it seems from the number of inquiries that we are receiving that the manufacturers in all lines where this work is applicable are realizing the value of inlaid work. There are many more ways, of minor importance, in which ornamental inlaid work is used, but I consider the foregoing sufficient to give the reader a general idea how an ancient art has been developed and elaborated upon to fit the requirements of our present-day needs.—Le Roy H. Block in Veneers.

Odd Phases and Practices of the Veneering Business

VENEERING presents many odd phases and contrasting practices and perhaps contains more variations than any other branch of woodworking. These odd features begin with the getting out and bringing to market of the timber cut with which to make veneer, and they only end with the final finishing up of the cabinet work and other finished products and their sale to the individual purchaser.

To begin with, there is no other industry in which there is such a wide variance in the raw material used. The logs out of which some of our veneer is made from come from the cheapest timber to be had, while on the other hand some of the fine logs for veneering have brought perhaps the highest price ever realized from timber. Illustrative of this point there is a story told of the purchase not so long ago of three logs in Liverpool all coming from the same tree and being purchased by three different parties, and the sum total paid by all of them for these three logs from one tree is given as $25,000.

There is no other branch of woodworking, and nothing else outside of mining where men will take any such chances as these in the purchase of something that must be opened up before they are actually sure of what they are getting for their money. In this case the tree was a fine African mahogany and it presented every outward appearance of containing an unusually fine and freaky figure. Presumably, too, this evidence was pretty strong and convincing, otherwise the experts doing the buying would never have bid the timber up to any such price. Yet no man is ever positive of just what he will find inside of a log until he cuts it open. Then it may even exceed his expectations in the matter of beauty, and then again it may develop unexpected defects that will seriously impair the value of his product.

To turn from the logs to the buying and selling of veneer we can find odd phases of this industry. The makers of built-up stock and plain panels go along steadily day after day with nothing more unusual than occurs in the buying, selling and working ordinary lumber. Their raw material has a fairly steady and even value and so has the finished product, varying now and then, of course, pretty much as standard stock in lumber varies. Those using face veneer, if it is oak, find some difference in the quality of the oak. The quartered oak is either fine or small figure or large, and the plain oak varies some, too. Mahogany generally runs plain or contains what is termed straight strip and ordinary mottle figure. These all have a fairly well established value, and the panel man knows pretty well in advance what they will cost him, and what he should figure on selling the made-up panels for and where he can get a supply promptly when it is needed.

The salesman on the road selling veneer to purchasers of this kind of a stock has pretty much the same kind of a job on his hands as the seller of lumber, except that it is a thin, light lumber product that he is selling which is somewhat more valuable than the general run of lumber stock.

This we may consider as the everyday phases of the matter, yet always every day or every week another phase enters here. The well-posted veneer salesman knows that there are certain users of veneer here and there who are from time to time in the market for something unusual in the line of figured veneer, and when they find what suits them they will pay fancy prices for it. The salesman looking for this kind of business figuratively keeps his ears cocked and his eyes open, and when he finds some veneer manufacturer who has cut up a log of unusual figure he looks it over and if he thinks it will appeal to a certain customer he gets samples and goes forth to make a trade in which there is no set price or standard value to guide him. He may have a log of mahogany cut into thin veneer that will bring 12 or 13 cents per surface foot. If it is a big log it will carry the value of that log into thousands of dollars. At the same time he may be selling every day other mahogany with a fixed or standard value that is not over 2 cents a foot.

Wrinkles in Cutting and Using

Not all the variations and odd things are in the buying and selling, though—not by any means. There is just as much difference in the work of cutting up and using the veneer. In this work we might paraphrase a popular saying that half the world does not know how the other half does its work or makes its living. The veneer user or the glueroom man who curved and shaped work may think he has complications to contend with now and then, but unless he has seen what some of the other fellows are doing he has but little comprehension of the infinite labor and pains involved in trimming, matching up and handling some of that freaky figure in veneer that comes from those logs which bring record-breaking prices—face veneer that costs more to start with than the plain panel man's stock will sell for after it is glued up. Naturally he must take great care of it, handle it gently, and manipulate it so as to get the most attractive effects. He may waste considerable in trimming, but it is not this waste that bothers his mind. The thing his mind is centered on is a study of the figures and of the articles that it has to be put into so that he may get the most striking effects and greatest beauty into it.

There are men who have a peculiar gift or knack for this kind of work just as there are other men who have a peculiar faculty for discovering or successfully making valuable veneer stock. It is not always the older man either, though of course the man of great experience is most likely to get satisfactory results in handling fancy figured woods. Often, however, young men soon develop this faculty to a remarkable degree, and when they do they become valuable men for this faculty alone, though they may know but little of what we consider the regular science of glue-using and glue economics.

On the other hand, there are men who are in charge of gluerooms putting up plain built-up lumber and panels of plain and ordinary face veneer who may become equally valuable without having any detailed knowledge whatever of the work of selecting and matching up the extra fancy figured work in veneering, for then there is a matter of quality and analytical science involved to get good results and greater efficiency.

There are really so many phases of the veneering business that it is doubtful if anyone can ever become thoroughly well versed in all of them. It would hardly be practical for any one man to spend enough time at work in the many places where the different kinds of veneering are done to get a thorough knowledge of all of it, though many men become expert at some special kinds of work. That is one reason why there are many conflicting ideas and opinions offered in connection with the veneer business, and for this reason no one man should be too generally assertive about the application of his own ideas. They may not come anywhere near fitting in with the needs of somebody else or with some other class of work.—C. L. Mason, in Wood Craft.

Increasing Demand for Inlay

ONE of the surest indications of an era of inlay work coming into favor again can be gained by the careful perusal of the spring editions of all the leading furniture manufacturers' catalogs, in which, to a greater or less extent, inlaid furniture is featured as the advance patterns of the coming styles in furniture.

This in itself should prove a great boost to the veneer industry in several respects. With the advent of inlaid products there will naturally be a greater demand for veneered goods, as the inlaying of solid furniture is entirely out of the question, and, furthermore, an almost unlimited variety of figure, colors and pleasing effects may be obtained which are otherwise impossible to procure.

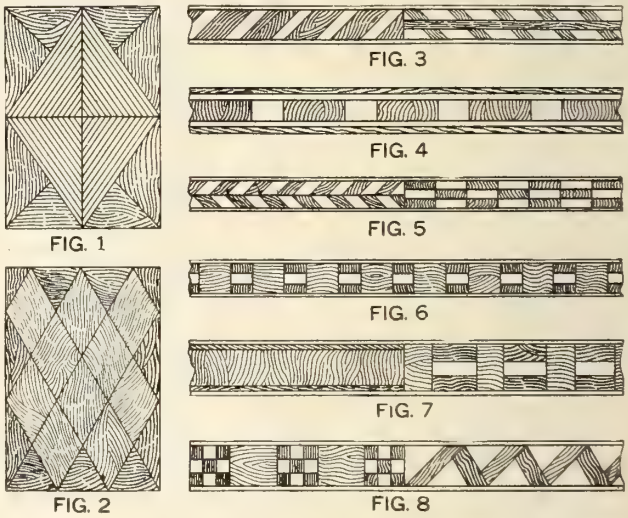


FIG. 1
FIG. 2
FIG. 3
FIG. 4
FIG. 5
FIG. 6
FIG. 7
FIG. 8

Grain effects and band inlay.

Inlaid furniture and articles once held the dominating stage, but lost much of their prestige by the large amount of inlaying that was done, without the least attention being paid to the beautifying and decorative effects of the different grains and colors used in any particular pattern. There should be no excuse whatever for doing work of this kind, and from the present outlook it would seem that firms which are featuring inlay work are bearing this well in mind, for the samples so far produced are so far above criticism that should the old masters in Chippendale, Hepplewhite and Sheraton arise to look these over, they would indeed find very little ground for criticism.

Herein, I will just give a few of the simpler patterns of inlay band work, the demand for which is increasing steadily, being mostly used in connection with the face veneering in flush or sanitary doors. Of

(Continued on page 48)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB **Hoffman Bros. Co.** HB

Estab. 1867, Incor. 1904—"Nuff said"

Reg U S Pat Off Reg U S Pat Off

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS,

1/24 and 1/30 Slice Cut

(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—*SPECIALTY*—

HB **Indiana Quartered Oak** HB

Reg U S Pat Off Reg U S Pat Off

Sawed Quartered Oak Veneers

WHITE OR RED——HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

(Increasing Demand for Inlay—Continued)

course, there is no limit to the amount of designs that may be worked out; nevertheless, to the beginner these designs will be found easy to construct.

In inlay banding a considerable amount of stock used is dyed, whitewood being the principal wood used, as it will absorb the dye better than other hardwoods. However, before attempting to dye whitewood to make ebony, mahogany or such colors as yellow, blue, green, etc., be sure you have a good dye, one that will thoroughly penetrate through the whole piece dyed, and one that does not fade; otherwise the principal object of inlay will be for naught.

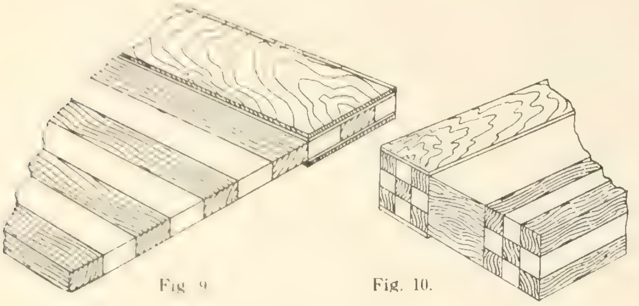


Fig. 9 Fig. 10.

How band inlays are made.

Figs. 1 and 2 show what a contrast can be constructed by using the same kind of veneer for the whole face side, only running the grain of veneer at different angles; especially is this true of plain oak. Figs. 3, 4, 5, 6, 7 and 8 will show different types of inlay banding. Fig. 9 shows how inlay banding is built up, this being similar to Fig. 4 inlay shown. No. 10 shows how the pattern used in Fig. 8 is built up, after which slices of the required thickness are cut off and worked into the different shapes or patterns required.—Veneers.

Merits and Demerits of Vegetable Glues

VEGETABLE glue has come to stay, or, perhaps the manufacturers of the product would say, it has come to stick, writes Edwin Max Bennett in the Furniture Manufacturer and Artisan. The statement is made with emphasis, regardless of the fact that some furniture factories had sad experiences attending its initiatory use. Most of the troubles that first resulted in the use of this product were caused by ignorance of its characteristics, and lack of intelligence in its application.

Fate handed us the animal glues first, and we are only just getting so we can apply them with a fair degree of knowledge, so why should we marvel if the first applications of a new product did not result satisfactorily? Had the vegetable glue been discovered first the probabilities are that we would have been just as slow in recognizing the value of the animal product when it did arrive.

Perfection, in any line, is not attained in a day, and the vegetable glue proposition has proved no exception to this rule. There is no doubt in the minds of any one but what the producers of these glues have had, and will continue to have, disappointments in their attempts to attain absolute perfection in all applications. When all is said, however, the fact is that when this glue is applied in an intelligent manner to those operations recommended to its use, just as good and in some instances more satisfactory results are obtained than if the animal glue were being used.

The writer does not profess to know who first discovered vegetable glue, but he believes its practical demonstration came at an opportune time for the demands of the remanufacturers of lumber. The fast decreasing herds of cattle caused a shortage in the raw material from which animal glue is made, and as the ranges are settled the shortage is bound to become greater. Then, too, the growing scarcity of high grade solid lumber and the resulting increase in price has compelled a tremendous consumption of veneers, and their many advantages, besides that of economy, insure an increased demand for built-up stock, and so for glue. Therefore the fact that some substitute was found for animal glue will no doubt influence the use of veneers and the price of the finished products.

It is one of the peculiar characteristics of vegetable glue that it seems especially adapted for built-up stock and veneer laying. The writer knows of desk, case goods, kitchen cabinet manufacturers and others who make furniture of national reputation, to say nothing of manufacturers of flush veneered doors, who state that by the use of the last discovered product they have reduced their glue costs from 15 to 40 per cent., while making the same or a better quality of goods.

Cost reduction is only one of the advantages attending the use of this product. It is practically odorless, and since it is applied cold, the workman appreciates the absence of heat in its application. Of further interest is the fact that it does not sour on standing and so cause waste. The glue joint once made is said to improve with age, and heat seems not to affect it in any way. This last named quality does away with blisters if the glue is properly applied. The users of vegetable glues made by reliable manufacturers find that the product runs uniform and they have to pay no attention to changing from one shipment to the next. In manufacturing it is claimed that the process can be controlled more accurately than even the consumers' conditions of use and the stock to which it is applied. Every batch is brought to a specific standard in the making. When finished it is critically examined and subjected to trial before stocking for shipment. With such care on the part of the manufacturers, who realize that they have a reputation to make and sustain, it is not surprising that the product is making rapid inroads into the field once held solely by the animal glue manufacturers.

The furniture manufacturer, especially the one who makes his own veneered stock, will do well to investigate the merits of this product. He should, however, bear in mind the fact that he cannot buy a quantity and spread it as he has been spreading the glues he has been in the habit of using, but he much accept the co-operation of willing manufacturers who are glad to demonstrate how it is best applied. They gained their knowledge after many vicissitudes of fortune, and the probabilities are that with their specializing they will eventually bring their product to the point where it will be in even greater demand than is the glue that was first discovered.

There are many different ways of heating glue, but the fact remains that the important matter in glue-heating is to avoid letting the temperature get too high and cook it. Authorities differ somewhat as to what is the correct temperature, but most of them admit that the danger line comes soon after the temperature goes above 150 deg. F.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1 16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1 20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum.
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

WRITE US FOR PRICES

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

Producers and Manufacturers

MAHOGANY Mexican, Cuba, African

CIRCASSIAN WALNUT
(Poti Wood)

East India Mahogany (Andaman Islands)

San Domingo (Direct Importation)

All Imported Woods in

LUMBER and VENEERS

Request our District Salesman to call upon you with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,

Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - **Ohio**

Write for a quotation on this space—it will put you in touch with veneer manufacturers.

Goshen Veneer Co.
GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for
Poplar and Red Gum Veneers and Crossbanding

CIRCASSIAN WALNUT VENEER

Lot No. 1, 9 flitches, 16000-ft., average value 4 cts. per foot.
Lot No. 2, 13 flitches, 23100-ft, average value 2 cts. per foot.

A DISCOUNT OF THIRTY PER CENT

Offered First Cash Buyer.

HUDDLESTON-MARSH LUMBER CO.,
2260 Lumber Street
CHICAGO, ILL.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES— - **KANSAS CITY, Mo.**

Kansas City Plant Exclusively

WALNUT

LUMBER AND VENEERS

American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:

BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM

Quartered

3 cars 4/4, 1's and 2's
2 “ 5/4 “
1 car 6/4 “
1 “ 8/4 “
3 cars 4/4 No. 1 Com.
1 car 5/4 “
1 “ 6/4 “
1 “ 8/4 “
1 “ 10/4 “

RED GUM

Plain

4 cars 4/4, 1's and 2's
2 “ 5/4 “
1 car 6/4 “
1 “ 8/4 “
1 “ 10/4 “
2 cars 4/4 No. 1 Com.
1 car 5/4 “
1 “ 6/4 “
1 “ 8/4 “
1 “ 10/4 “

THE FAMOUS CACHE RIVER GUM

Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

Cincinnati Veneer Co.

Manufacturers of

Veneers

and thin lumber in all thicknesses

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments.

Stock all well manufactured from selected logs and roller dried.

Cincinnati -:- Ohio

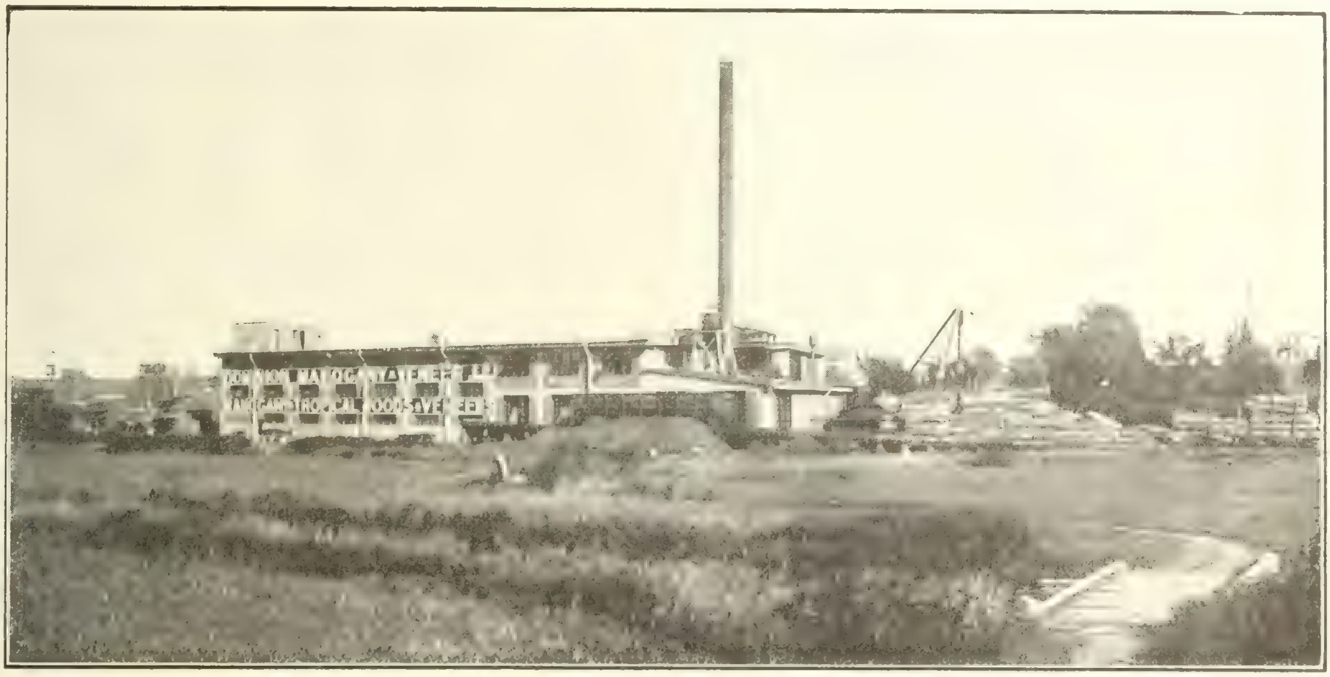
OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Dominion Mahogany & Veneer Co., Limited

MONTREAL WEST, QUE.


DOMINION MAHOGANY & VENEER CO. LTD.
AFRICAN & TROPICAL WOODS & VENEERS

Veneers in Stock—Ready for Prompt Shipment

Sliced African Mahogany, 1/24, 1/20, 1/16, Plain and Figured.
Sawed African Mahogany, 1/24, 1/20, 1/16, ⅛, 3/16 and ¼, Plain and Figured.
Sliced Mexican Mahogany, 1/24, 1/20, 1/16, Plain and Figured.
Sawed Mexican Mahogany, 1/24, 1/20, 1/16, 1/18, 3/16, ¼, Plain and Figured.
Sawn Cuban Veneer, 1/20, 1/16, selected stock.
English Oak Veneers, 1/16 sawn.
Curly Birch 1/24 Sliced, Figured.
Circassian Walnut, 1/24, samples sent on request.
French Walnut, 1/24, samples sent on request.
Italian Walnut, 1/24, samples sent on request.
American Walnut, 1/20, samples sent on request.
Prima Vira Mahogany, 1/24, samples sent on request.
American Quartered White Oak, Sawed, 1/20, 1/16, ⅛, 3/16, ¼, selected for figure.
American Plain Sawed Oak, 3/16, ¼.
R. C. Red Oak, 1/16, ⅛.
R. C. White Oak, 1/16, ⅛.
R. C. W. Ash, 1/16, ⅛.

R. C. Brown Ash, 1/16, ⅛.
R. C. Poplar, 1/24, 1/20, 1/16, ⅛, 3/16, ¼.
R. C. Birch, 1/24, 1/16, ⅛, 3/16, ¼.
Sawed Yellow Poplar, [illegible], 10 in. and up wide.
R. C. Chestnut.
R. C. Pine, ⅛.
R. C. Maple, 1/28, 1/20, 1/16, ⅛, ¼.
African Mahogany Lumber in all thicknesses at right prices.
Mexican Mahogany Lumber in all thicknesses at right prices.
Cuban Mahogany Lumber in all thicknesses at right prices.
Teak Mahogany Lumber in all thicknesses at right prices.
Vermillion Mahogany Lumber in all thicknesses at right prices.
Black Bean Mahogany Lumber in all thicknesses at right prices.
Satinwood Mahogany Lumber in all thicknesses at right prices.
English Oak Lumber in all thicknesses at right prices.
Spanish Cedar Lumber in all thicknesses at right prices.
Maple Lumber in all thicknesses at right prices.

Special.—About 1 car of 1-in. hard White Maple, good for flooring, and 1 car of 5/4 Birch and Maple No. 1 Common and Better.

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

The Hardwood Market

THE general tone of business concerning hardwood interests all over the country has not changed to any material extent within the last few months. Manufacturers are giving a good deal of attention just now to the probable outcome of this season's crops, but, the general aspect aside, the influence of the estimated crop returns can scarcely be said to alter the situation to a very great extent. Summing up the situation as disclosed in reports to hand we are inclined to think that on the whole it does not appear, nor can it be resasonably expected, that there will be a substantial increase in activity until the beginning of buying for the fall season. The conditions in the hardwood market in Ontario would seem to indicate that the usual enquiries as to the tone of business which one usually hears in semi-depressed times, is displaced by the query as to what material manufacturers have to offer. Birch, and especially 1-in. birch, is said to be firmer than ever and sales for upper grade stocks are reported to have been made in this market in the last few weeks at considerably increased prices. Maple and other Canadian hardwoods are moving at the usual quotations and there is no indication that present stocks, which are low, will not be amply taken care of without reduction in prices in any grade whatever. A leading manufacturer of hardwoods registers the compliant that our Ontario manufacturers of birch lumber do not cut more of their product into 1-in. lumber and thinner stock. From the manufacturing standpoint it is contended that manufacturers would gain in grade or over any difference in price. Seeing that at present the excess of thick stock manufactured is a set-back to the birch market this should show the birch manufacturer that the market does not call for nor require the quantity of 1½, 2 and 3-in. now being produced. On the face of it the suggestion appears to be a good one and one worthy of comment by leading hardwood manufacturers.

American hardwoods used in Ontario are said to be in much the same condition as for some weeks past. Oak, the principal American hardwood imported, remains stationary, although it commands the price that has been prevailing for several months. White ash is firm and practically all American hardwoods are selling at prices that have held good during the present year. From all sources it would appear that trade in American hardwoods is more normal in Ontario than, for instance, New York State or Michigan, and that with the resumption of business to normal conditions in the United States and the opening up of its large export trade in hardwoods to the United Kingdom, there is no question of an advance in price taking place. One reason for this which the buyer should consider is that while business conditions have curtailed the buying of American hardwoods, both at home and abroad, home conditions have curtailed the production in equal or greater volume, so that when the normal demand is again the order of the day the lumber is not at present in sight to supply it. Reviewing trade conditions in hardwoods, the American Lumberman says:

"Hand-to-mouth buying still characterizes the hardwood trade. Manufacturers are holding up prices well, however, and the prediction is made that there will be no cutting and slashing in efforts to force the market. Business is bound to be better a little later in the year, for little stocking up has been indulged in at any time this year, with the result that consumers are going into the last half of the year with very little lumber on their yards. Quartered oak is moving well. Ash is in really good demand. Poplar is rather quiet, although some grades are moving. The farm implement people are absorbing considerable ash, hickory and other woods. Railroad material is uncalled for. Red gum is receiving a lot of inquiries and a much wider interest has been manifested in this wood. Cottonwood in the upper grade is slow. Some northern stock is moving. Dry birch and maple are said to be in small supply, with the new cut not yet ready for shipment. Prices are firm, and the situation is said to be fairly satisfactory from the standpoint of those who hold any quantity of dry stock."

The Hardwood Record observes that there is no reason for doubt as to the ultimate outcome of the situation, as with the excellent fundamental conditions, including a record-breaking crop prediction, the resumption of business is definitely promised for the fall months. Oak stocks are probably not in so favorable a condition as gum stocks, but they continue to be among the stronger sellers. Of course low grade lumber going into box and crating materials is the best property on the market to-day.

Southern Hardwood and Veneer Market

Correspondence of the Canadian Woodworker

Louisville, Ky., June 18: While no price changes of any great importance have been in evidence during the past month, it is generally agreed that the tone of the market is somewhat firmer. The chief reason for this is the prospect of a bumper wheat crop, which will form the foundation upon which business men in all lines may build with confidence. While it is true that good crops alone cannot make good business, it is equally true that without good crops there cannot be prosperity. Hence the development of what promises to be bumper productions of most of the staples is, as suggested, at least a foundation upon which the industries can build. Inasmuch as giving the farmer money is equivalent to giving it to most other people since the farmer is a universal consumer, big crops are sure to mean increased activities in all lines; the liquidation of indebtedness by merchants dependent on the farm trade, heavier buying by them, and consequently increased operations by manufacturers who sell to the farmers, which means a great many members of the woodworking trades.

The furniture situation, for one, has been favorably influenced by the condition referred to. Furniture factories as a rule have been operating at less than capacity during the past six months, general business not having been active enough to justify any more aggressive operations. Prospects now are largely dependent on the outcome of the semi-annual furniture shows, which will be held in July. But every indication is that the result of the shows will be better than usual, for the retail merchants, knowing that their own communities will be in a position to buy more heavily as the result of the big crops, will be able to place larger orders than they have been giving of late. In addition to this, it is generally conceded that business with the furniture trade is better during the last half of the year than the first half, because of the fact that the October bride is now more numerous than her sister, the June bride. Fewer young couples, the backbone of the

General News and Notes

The Hammond Furniture Manufacturing Company, Vancouver, B.C., has suffered loss by fire.

Operations on the erection of a planing mill at Ottawa for A. G. Acres have been commenced.

At Sherbrooke, Que., the firm of Geo. Long & Son, sash and door manufacturers, has been dissolved.

The Whitlock Lumber Company, Limited, has been incorporated with a capital of $20,000. The head office is at Alsask, Sask.

The Wellington Lumber Company, Limited, has been incorporated with head office at Nanaimo, B.C., as shingle manufacturers and timber merchants. The new company starts with a capital of $50,000.

At Victoria, B.C., the E. W. Whittington Lumber Company has been incorporated with a capital of $75,000, as sash and door manufacturers and sawmill proprietors. The centre of operations will be Victoria.

The Oakville Basket & Veneer Company, Limited, with headquarters at Oakville, Ont., has been incorporated a private company to acquire, as a going concern, the business of the Oakville Basket Company. The new company, which has a capital of $100,000, will manufacture baskets, boxes, paper and pulp.

The London Advertiser of recent date published an interesting notice of the success as a wood carver of Mr. Wm. R. Hawthorne, a resident of London, Ont. Although a stonecutter by trade, Mr. Hawthorne for the last quarter of a century has devoted his spare time to the fascinating art of wood carving and as a result has won notable success in the execution of pieces, such as bookcases, cabinets and designs of a miscellaneous character. He prides himself with having mastered the intricacies of the craft without instruction of any sort.

A recent advice from the Maritime Provinces states that New Brunswick is beginning to engage outside attention owing to the wealth of the province in hardwoods, both in quality and quantity. It is said that birch, maple, elm, oak and ash are found in abundance and that furniture and other woodworking manufacturers of Upper Canada are turning their attention towards New Brunswick as a field for the supply of hardwood lumber. The timber resources of New Brunswick are important when it is considered that heretofore several million feet of hardwood lumber has been imported annually.

That boat building at Brockville, Ont., is steadily on the up-grade is indicated by the excellent work turned out from the plant of the Gilbert Boat Works. A large number of important contracts have been completed for this year and the firm are at present at work on several special contracts, one of which is a thirty-five-foot solid mahogany boat which is to be built for Mr. W. H. Downey. Another special order is for a racing canoe, also solid mahogany, for Mr. Ralph Britton, of Gananoque, to be used in competing for the world's championship in sailing canoes. This important branch of the woodworking industry is evidently gaining ground in Brockville.

PATENTS

STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) **TORONTO, CAN.**
The business of Manufacturers and Inventros who wish their
Patents systematically taken care of is particularly solicited.

For Sale

White Plain Sawn Oak Lumber: 1 car dry 2½-in. First and Seconds and Number One Common—very wide run; also 1 car 3-inch Ohio stock—not surface checked. Also 4 x 4 in., 8 to 16 ft. dry Oak. Charles F. Shiels & Company, Cincinnati, Ohio, U. S. A. 5-6

For Sale

Woodworking shop fitted especially for general work, such as interior trim, store and office fixtures, sash, doors, etc. New and up-to-date machinery recently installed. Blower system. First-class dry kiln. Railway siding. Situated in a thriving Ontario town. Owners well and favorably known to the trade and are doing a splendid business.

This is an exceptional opportunity to buy a bright business already established.

Apply to X Y Z,
x5-6 C/o Canadian Woodworker, Toronto.

Hardwood Salesman

Are you open to represent a live United States exporter of hardwoods? If so, send your name and address with some particulars of your connection and qualifications to Box 36, Canadian Woodworker, Toronto. 6

Positions Wanted

Employment Wanted

Position wanted as Superintendent or general foreman, experienced in interior house work, bank, store and office fixtures, estimator and draftsman. Furnish references. Box 34, Canadian Woodworker, Toronto. 5-6

PATENTS

Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% PROFIT SHARING

Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

OVER 65 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.

MUNN & Co. 363 Broadway, **New York**
Branch Office, 625 F St., Washington, D. C.

furniture business, are going to house-keeping in midsummer, and more are waiting for the fall. October having become as popular a month for weddings as June, it is easy to see why furniture sales are larger in the fall than they are in the spring. At all events such is the case, and this explains why the factories which have been selling a comparatively small amount of goods during the fore part of the year expect to be able to take care of an unusually large output during the remainder of the twelvemonth.

During the time that the furniture factories have been doing only a fair business, the veneer and panel plants have been similarly quiet, operations having remained below normal, and in some cases production having been only about one-third to one-half of normal. This is largely because of the fact that the panel manufacturer must make up his stock to the specifications of his customer, and cannot anticipate these to a large extent. This, by the way, seems to constitute a strong argument in favor of standardization of dimensions, in order that a cessation of actual orders might not prevent the manufacturer of glued-up stock from continuing to make goods which he could put into stock and carry in anticipation of a better business later on. In fact, this is what some of the panel manufacturers have proceeded to do. In spite of their inability to go beyond the staples like table tops, which come as close to being standardized as anything else, they have shown their confidence in the business situation by manufacturing a lot of goods for stock, and carrying a considerable investment based on the belief that the requirements of the trade will soon be sufficient to absorb the entire offerings. In case there is a market improvement in business, of course this stock will come in very handy, and will enable concerns which can ship goods immediately to have a decided advantage over their competitors, who will have to make up the stock before they can ship it.

Consumption of hardwoods in the implement and vehicle field has been unusually large thus far, this again being a reflection of good crop prospects. The farmers have been buying heavily, and implement, wagon and buggy factories have been running full time and capacity getting out the goods. If the crops are as big as they are expected, to be, the consumption in this section of the woodworking field will be larger than in several years.

As reported last month, prices seem to be down to bed-rock, and in view of the cost of timber it is hard to figure a reduction. Plain oak is being helped somewhat by an improved demand from the interior finish factories. Quartered oak has been in good call right along from the furniture trade. Red gum is in good demand, the versatility of the wood and its use in so many industries being one of the reasons why it is staying up pretty well. A fair export demand is also in evidence, though the export trade is quiet, in sympathy with the domestic trade. Poplar is generally quiet, though some grades are moving. Chestnut is in good demand, especially sound wormy. Hickory and ash are selling well. If, owing to the fact that factories are carrying light stocks, summer demand is above the average, the market will probably enter the fall much stronger than it has been since the autumn of 1913.

Don't stick to the old way of doing things just because it is the old way. You need a better reason than that.

Woodworking News

From Coast to Coast

At Ottawa, Ont., Mr. J. R. Booth has had plans drawn for a new timber mill to cost $20,000.

The sash and door factory of Paul Beaudry, Montreal, was destroyed by fire on June 12 at a loss of $60,000.

At Aylmer, Que., the planing mills owned by T. Ritchie, Limited, were destroyed by fire on May 31, the loss being $20,000.

A new cooperage firm to receive a charter is the Charles Mueller Company, Limited, Waterloo, Ont., with a capital of $250,000.

At Redcliffe, Alta., the planing mill of Messrs. Houston & Hanley has been practically completed and operations will begin shortly.

Foundation work has been completed for a furniture factory at Stratford, Ont., estimated to cost $14,000. The prospective owner is Chas. Diebel.

The stave mill at Strathroy, Ont., owned by the East End Stave Mills, was destroyed by fire early this month. The loss was $10,000, covered by insurance.

The planing mill at Ottawa, owned by J. & C. Low, contractors, was destroyed by fire late last month. The total loss was $60,000. Machinery to the value of $10,000 was destroyed.

Prices are invited by the School Board of Victoria, B.C., for one car load, assorted sizes, of single school desks, to be delivered August 15 next. The Secretary is W. T. C. Pope, 1127 Catherine Street, Victoria.

The sawmill of Mr. B. L. Moore, located at Moore's Mills, eight miles from St. Stephen, N.B., was destroyed by fire recently. Another sawmill in the same district, owned by Mr. A. J. Maxwell, has also been burned down.

At Peterborough, Ont., a slight fire, supposed to have been caused by a spark from a locomotive, broke out on the roof of Mann's cheese box factory recently. Two lines of hose were laid and the fire was extinguished before extensive damage was done.

At Thetford Mines, Que., the sawmill owned by Mr. Benjamin Ainsley was completely destroyed by fire recently, the loss being only partially covered by insurance. The mill will be rebuilt and the company will be in the market for new machinery.

Mr. J. E. Alain, of the Victoriaville Furniture Company, has been elected a member of the executive council of the Canadian Manufacturers' Association, while Mr. William Rutherford, of William Rutherford Sons Company, Montreal, is on the education committee.

The Andrew Malcolm Furniture Company, Kincardine, Ont., has received the contract to supply the furnishings of the new wing at the Banff Springs Hotel, Banff, Alta.; refurnish the Vancouver Hotel, Vancouver, and the new wing of the Alexandria Hotel, Winnipeg.

At Strathroy, Ont., on June 3, the East End stave mill, owned by Mr. J. P. Bogue, and said to be one of the biggest plants of its kind in western Ontario, was burned down with a loss of about ten thousand dollars. The cause of the fire is unknown and very little insurance is carried.

At Midland, Ont., on June 10, lumber to the value of $250,000 was burned by fire in the lumber yard at the mill owned by Mr. Manley Chew. The bulk of the lumber is said

B. C. Fir Timbers
and
Clear Finish Stock
Kiln Dried or Air Dried
Red Cedar Shingles
Write or Wire
W. G. Scrim Lumber Co.
Vancouver, B.C.

Canadian
Hard and Soft Woods
Carefully Selected Stocks Carried
Your Enquiries Solicited
C. A. Spencer
603 Eastern Townships Bank Building
MONTREAL

The Atlantic Lumber Co.

Manufacturers and
Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

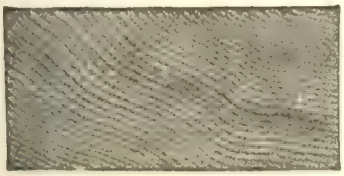
110 Manning Chambers - TORONTO
Phone Main 6386
HOME OFFICE, BOSTON, MASS.
Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Steven & Jarvis Lumber Co.
OF
Eau Claire, Wisconsin

Offer You Standard Grades
Well Manufactured

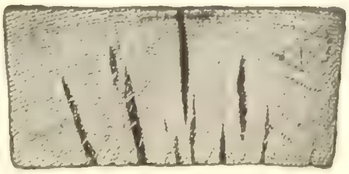
Ash
Rock & Soft Elm
Hard & Soft Maple
Birch
Basswood

Stocks cut 4/4, 5/4, 6/4, 8/4, 10/4, 12/4.
Write us for prices delivered your station.



Every kind and form
of
DRYING LUMBER

Grand Rapids Dry Kiln
QUALITY DRYING
Grand Rapids
Mich. - U. S. A.



Plain Sawed Oak
Mills in West Virginia and Kentucky
Wilcox & Knapp
Conneautville, Pa.
Quotations Cheerfully Furnished

Buy Direct
From the Manufacturer
We are their Salesmen

The
Saw Mill Owners Sales Co.
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston
New York
Watertown
Montreal
Quebec
Toronto

Ash
B.C. Doors
Birch
Basswood
Beech
Cherry
Cedar
Chestnut
Cottonwood
Elm
Fir Finish
Hickory
Hemlock
Maple
N.C. Pine
Oak
Poplar
Red Gum
Red Pine
Sap Gum
Spruce
Sycamore
Shingles
Tamarac
Timbers
Walnut
White Pine
Yellow Pine

We Solicit Your Inquiries

to have been owned by the Nettier Lumber Company and was fully insured. The cause of the fire is unknown.

The American Woodworking Machinery Company, Toronto, has been awarded the contract, amounting to about $1,250, for school apparatus at Toronto, including one band saw, three laths with motor, one jointer, one bench wood trimmer, drilling machinery and wood turning tools.

At the factory of the Standard Box Company, Lennoxville, Que., a young man named Archie McDonald, who belongs to Sherbrooke, Que., got his arm entangled in the machinery and badly crushed, with the result that amputation of the limb below the elbow was rendered necessary.

The Muskoka Wood Manufacturing Company, Huntsville, Ont., whose mill at Axe Lake, Ont., was burned down on May 17, report that they will replace the plant and hope to have the new mill in operation by November. The style of structure which will be erected has not yet been decided upon.

About half-a-million feet of lumber in the yards of the Three Valley Mill, twenty miles west of Revelstoke, B.C., was destroyed by fire recently. The loss, which was covered by insurance, is fixed at $25,000. The mill, which is the property of the Forest Mills of British Columbia, Limited, was undamaged.

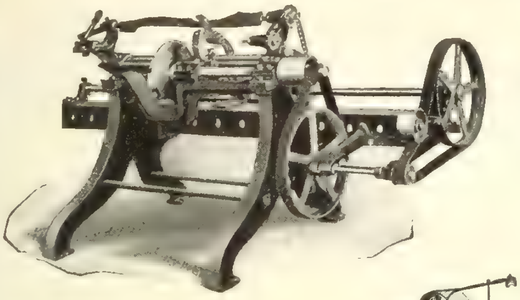
Mr. Robt. McJannett was recently appointed manager and buyer for the furniture department of the R. F. MacMillan store at Saskatoon, Sask. Mr. McJannett was on the furniture sales staff of Murray-Kay, Limited, Toronto, until a couple of years ago, since when he has served with the Cope, Fletcher Furniture Company, Saskatoon.

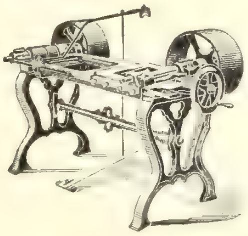
Mr. J. E. Baechler, Goderich, Ont., announces that his new sawmill, to replace the one recently burned down, will be 60 ft. by 90 ft., and will have a daily capacity of 25,000 feet. The planing mill will be 60 ft. by 130 feet and two storeys high. Both mills will be equipped with the latest and most up-to-date machinery. The plant is expected to be in operation about the middle of July.

There is a manifest dullness in trade in many parts of Eastern Canada at the present time. In Brantford, Ont., one planing mill is operating only forty-four hours a week. The box business is very quiet. This is due largely to the fact that the canning industry is passing through a period of depression, consequently the number of orders for boxes is much below the average for this time of the year.

Extension of the Hydraulic Press Manufacturing Company's Plant

The Hydraulic Press Manufacturing Company, of Mount Gilead, Ohio, have found it necessary to enlarge their brass foundry owing to increased business. This foundry now occupies an entire building 90 ft. long by 30 ft. wide. Three furnaces are continuously in operation and the company build all the valves and fittings for their extensive line of hydraulic presses and pumps. Recently the firm have put in operation a new erecting shop to accommodate their heavy hydraulic presses and pumps. The equipment of this building, which is 120 ft. long, and 80 ft. wide, with an extreme height of 54 ft., includes a heavy electric travelling crane for handling heavy castings and transporting machined parts for assembling. Two accumulators, one for high pressure and one for low pressure, and an intensifier have been put in operation for testing purposes. The testing equipment also includes motor driven high and low pressure pumps, which are controlled by automatic electric starters. This equipment has a maximum pressure capacity of 10,000 lbs. per sq. in. With a progressive organization at their head the Hydraulic Press Manufacturing Company have developed considerably in the last few years.





Start a Business of Your Own

The **"OBER" Line of Handle Machinery** will help you.

Lathes, Sanders, Rip Saws, Cut-Off Saws, Bolting Saws, Etc., for getting out **Handles** of various kinds, **Whiffletrees, Neck Yokes, Spokes, Ball Bats, Spindles** and **variety work.**

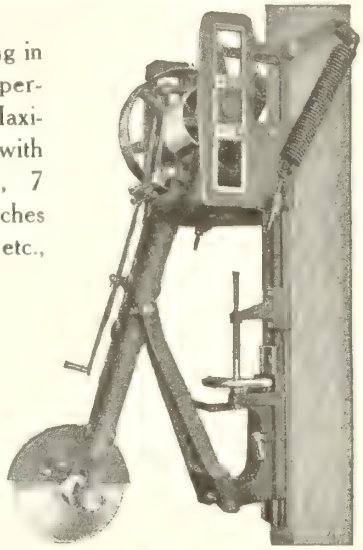
OBER Machines are **moderate in cost, easy to operate, strong and durable.**

Write for free information and catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS, O., U.S.A.

PRYIBIL No. 5 Parallel Saw and Groover

This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.



P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago
If interested in Woodworking Machinery, Write us.

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited
Hull, Quebec

Stewart-Greer Lumber Company

Band Mills
Mangham, La.

General Offices
St. Louis, Mo.

We ship direct from our own mills. All of our stock is **BAND SAWN**, cut from large Virgin Timber and well manufactured. We are in position to make immediate shipment of the following dry lumber:—

Quartered White Oak
2 cars 4/4 1s and 2s.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.

Plain White Oak
8 cars 4/4 1s and 2s.
10 cars 4/4 No. 1 Com.
15 cars 4/4 No. 2 Com.

Plain Red Oak
10 cars 4/4 1s and 2s.
10 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

Red Gum
10 cars 4/4 1s and 2s.
15 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.
3 cars 1/2 in. Common & Better.
2 cars 3/4 in. Common & Better S2S.

Sap Gum
5 cars 5/8 in. Common & Better.
5 cars 3/4 in. Common & Better.
3 cars 13/17 in. Box Boards.
10 cars 4/4 1s and 2s.
10 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

Archer Lumber Company

HARDWOOD LUMBER

Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards	28718
4/4 18 in. and up Panel	33905

Southern Red and Sap Gum

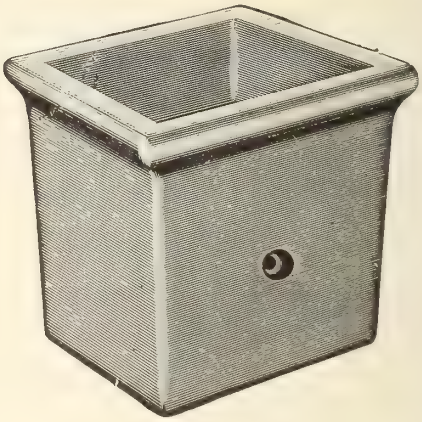
Our Specialty

Plain and Quartered sawn, and sorted for Mahogany or Circassian Finish. We guarantee our Gum to be as straight as any other wood. If you have used gum and had bad luck, let us talk to you about it, and if you have never used gum and desire a fine cabinet wood that will take any finish let us tell you how to get the best results. Also

Fine Figured Quartered White Oak

G. H. Evans Lumber Co.
Hardwoods and Pine
CHATTANOOGA, TENNESSEE, U. S. A.

Metal Shoes For Table Legs



We manufacture an unusually fine line of cast brass, bronze and iron with various finishes. Carry a complete stock and can make prompt shipments. Send for our money saving catalogue.

REFLECTOR & HARDWARE SPECIALTY MFG CO.
Western Ave. at 22nd Place
Chicago, Ill.

INDIANA
HARDWOODS

Young & Cutsinger
Manufacturers and Wholesale Dealers
Hardwood Lumber
Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed
Main Office - Evansville, Ind.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

OAK
Quality First Brand
GUM

Licking River Lumber Co.
114 Lumber Street
SOUTH BEND, INDIANA

Long-Knight Lumber Company
Circassian, Veneers, Mahogany
Hardwood Lumber
INDIANAPOLIS - - INDIANA

OHIO

Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY

Cincinnati, Ohio

OAK
5 cars 4 4 No. 1 and No. 2 Common Plain

DIMENSION STOCK
We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT
4 cars 4 4 Sound Wormy

BASSWOOD
2 cars 4/4 Log Run

YELLOW PINE
5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller
Lumber & Veneer Co.
CINCINNATI -:- OHIO

Manufacturers of
Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.
CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR

Extra Wide 1, 2, 3 and 4 inch 5/8" PANEL STOCK
6" x 6," 7" x 7" and 8" x 8" Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati, O.

ATTENTION Mr. Furniture Man—

If it is to your advantage to have stock that is
Even Colored, Soft in Texture try a car of our Plain or Quartered Oak
25,000,000 ft. of dry stock on hand at all times—cut from a tract of 95,000 acres of timber.

The Mowbray & Robinson Company Main Office, CINCINNATI, OHIO

MILLS: Quicksand, Ky. WestIrvine, Ky. Viper, Ky. YARDS: Cinncinnati, Ohio Detroit, Mich. Rochester, N. Y. Brooklyn, N. Y.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO
—*We make a specialty of*—

Mills:
Kentucky Tennessee
W. Virginia

Soft Texture Red and White Oak
Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of
DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company
CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chesnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

For Immediate Shipment

West Virginia Stock

Thoroughly Dry and Well Manufactured

2 cars 4/4 firsts and seconds, Plain White Oak.
4 cars 4/4 No. 1 Common Plain White Oak.
5 cars 4/4 No. 2 Common Plain White Oak.
3 cars 4/4 No. 1 Common and Better Plain White Oak.
Worm holes no defect.
2 cars 6/4 No. 1 Common Plain White Oak.
1 car 5/4 firsts and seconds Plain White Oak.
7 cars 4/4 Sound Wormy Chestnut.
3 cars 5/4 Sound Wormy Chestnut.
5 cars 6/4 Sound Wormy Chestnut.
2 cars 8/4 Sound Wormy Chestnut.
3 cars 4/4 No. 1 Common and Better Chestnut
1 car 5/4 No. 1 Common and Better Chestnut
2 cars 6/4 No. 1 Common and Better Chestnut.
1 car 8/4 No. 1 Common and Better Chestnut
6 cars 4/4 No. 2 Common and Better Poplar.
3 cars 5/4 No. 2 Common and Better Poplar
4 cars 6/4 No. 2 Common and Better Poplar.
2 cars 8/4 No. 2 Common and Better Poplar.

Write at once for Quotations. **The Price is Right**

The Imperial Lumber Co.
Columbus, :-: Ohio.

OAK and RED GUM
OUR SPECIALTY

At our Tennessee mill we are producing some choice
Plain and Quartered Red and White Oak. Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

Prompt Shipments and High Grades our Hobby. Let us quote you on your requirements.

Mills—TENNESSEE
ARKANSAS

DUHLMEIER BROTHERS

Main Office & Yard
CINCINNATI, OHIO,
U. S. A.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sinker-Davis Co., Indianapoils, Ind.

BAND SAWS
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Canada Machinery Corporation,. Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R.. Toronto.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.

EDGERS (Gang)
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Bass Bros., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Anderson & Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Licking River Lumber Co., South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Sawmill Owners Sales Co., Montreal, Que.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Stevens & Jarvis Lumber Co., Eau Claire, Wis.
Stewart-Greer Lumber Co., St. Louis, Mo.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

JOINTERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Anderson Lumber Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.

MACHINE KNIVES
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS
Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Sidney Tool Co., Sidney, Ohio.
Smith & Phillips Mfg. Co., Chicago.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS
Bass Bros., New York.

SANDERS
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Black Bros. Machinery Co., Mendota, Ill
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Bass Bros., New York.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

SAW JOINTERS
Diehl Machine Works, G. M., Wabash, Ind.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill
Diehl Machine Works, G. M., Wabash, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby Company, A. B., Toronto, Ont.
Sheldons Limited, Galt, Ont.
Toronto Blower Company, Toronto.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio
Ober Mfg. Company, Chagrin Falls, Ohio

SPRINKLER EQUIPMENT
Keiths, Limited, Toronto.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Berlin Machine Works, Ltd. Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Sidney Tool Company, Sidney, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Talbot-Zoller Lumber & Veneer Company, Cincinnati, Ohio.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WINDOW FRAME MACHINERY
Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE
Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

YELLOW PINE
Prendergast Co., Cincinnati, Ohio.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher and the Ambitious Student

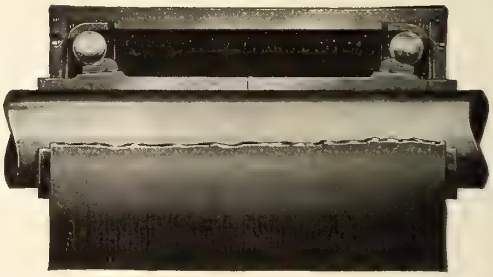
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline **once a year** is all the **attention and lubrication** required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS GLUE

(VEGETABLE)

SETS—STICKS—STAYS

A substitute is commonly understood to be something which will produce "nearly as good" results.

Many glues are substitutes.

Atlas Glue is not a substitute because it produces better results.

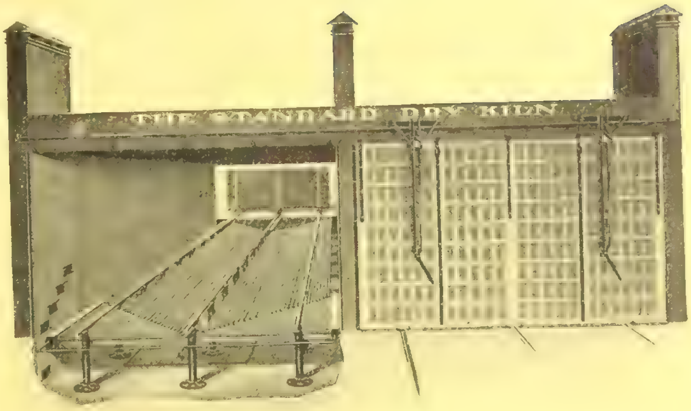
Note these points of advantage:

Heatproof,
Odorless,
Reliable,
Economical,
No Hot Cauls.
No Cold Air Blisters,
Sets Properly,
Does Not Injure the Hands.

Why don't you use the best? We don't ask you to take our word, but are willing to show you.

WRITE NOW—RIGHT NOW

National Process Company
Manufacturers
Address Dept. C. Indianapolis, Indiana, U. S. A.



Recently Installed Another STANDARD DRY KILN

Seven years ago The Eckman Furniture Company, of Jamestown, N.Y., put in a Standard Moist Air Dry Kiln. Its success is shown by their recent order for another kiln and by this letter:

> "We are drying oak, maple and birch in these kilns, to our entire satisfaction. We can conscientiously recommend the Standard Dry Kiln."
>
> Eckman Furniture Co.

In The Standard Kiln, the drying elements are always absolutely under the control of the operator and it is a simple matter to adjust them so as to precisely suit the special requirements of **your** product. Write for the catalog, containing a list of hardwood manufacturers who use The Standard Kiln. Address: The Standard Dry Kiln Company, 1560 McCarty Street, Indianapolis, Ind.

One of Our Customers Says

"Since going through your factory I can understand why your glue always runs ***absolutely uniform*** and that is on account of the great care which you use in its manufacture."

Originators of Perkins Vegetable Glue

Patentees of Perkins Vegetable Glue

The Factory Behind the Goods.

Do not let the fact that we can save 20 percent over your hide glue cost make you afraid of our vegetable glue and prevent your giving it a trial. ***We sell on quality, you save on cost.***

Perkins Glue Company
809 J. M. S. Building SOUTH BEND, INDIANA

MARIETTA
wood finishes are
beautiful as well as
practical

The finisher appreciates them, because they are practical; the furniture manufacturer, because they are beautiful and help to sell his product

But they are appreciated most for their long service and loveliness in the homes of his customers' customers

Try our 1914 Process NON-FADING MAHOGANY STAIN. Sample Panels and full particulars on request

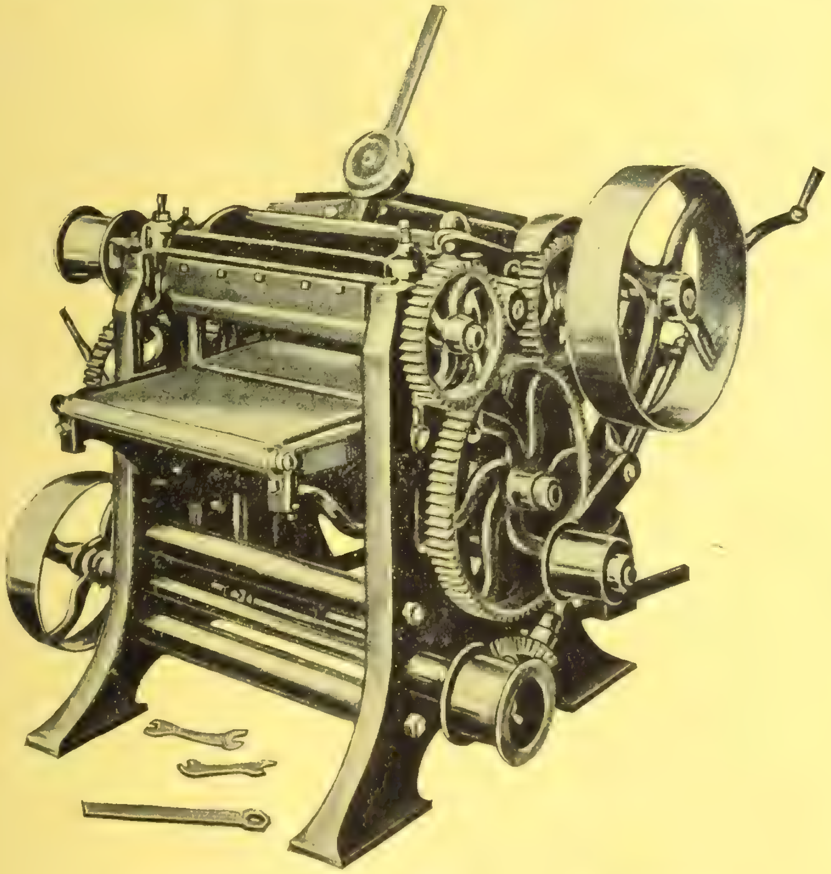
MARIETTA WOOD FINISH SPECIALISTS

THE MARIETTA PAINT & COLOR CO
MARIETTA OHIO

Volume Fourteen TORONTO, JULY, 1914 Number Seven

CANADIAN WOODWORKER and Furniture Manufacturer

Our Ideal Pony Planer



Equipped with Countershaft, Knives and Wrenches.

Planes
20″ wide, 7″ thick

Steel Cylinder
Babbitted Bearings
Four Feed Rolls

Our Special Price
$110.

Everything in Machinery—Send for Illustrated Catalogue.

H. W. PETRIE, LIMITED
TORONTO, ONT.

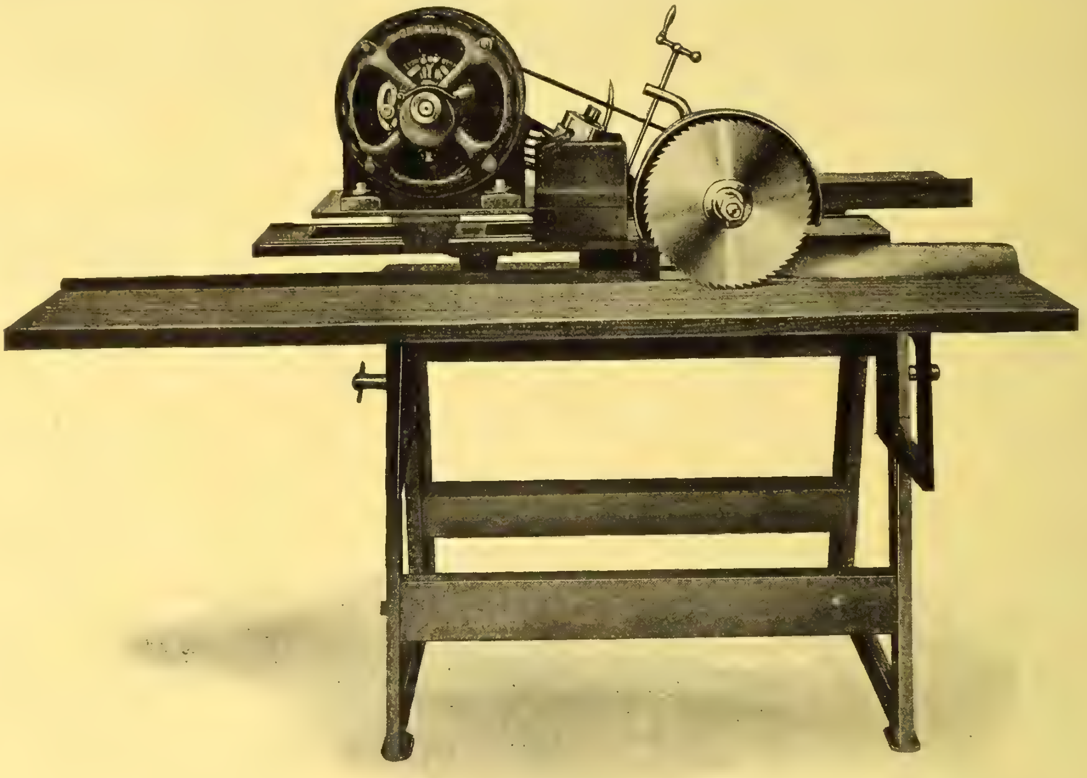
Alphabetical List of Advertisers, page 10

The Illustration Below is our

No. 2 Elliot Woodworker

This machine is used by over four hundred Carpenters and Builders, Cabinet Makers, Stair Builders and other woodworkers.

This is the most economical machine on the market. Costs to run in Toronto about $1.25 per month full time. The saw spindle is run direct from the motor. It will rip and cross cut 3-in. thick. The carriage swings around on a pivot the same as a mitre box, for cross cutting, dadoing, mitering, etc.



Patented 1910

The above illustration shows the machine set for ripping. Note the hand screw above saw for raising and lowering Cutters.

We have about 250 machines in use in Toronto alone. This is an indication of what the public think of our machines. We have had no repairs to make for the past year. Every machine is tested and guaranteed. We use the best motors made on all machines, which develop about 2 h.p., and will do more work than can be done on any other and give double the power

The machine can be moved from room to room or taken out doors the same as a carpenter's bench.

Our Bench Jointer and Band Saw running from the same motor, makes a complete outfit for making door and window frames, sash, housing out stair string, or running moulds, in fact any work required on a building.

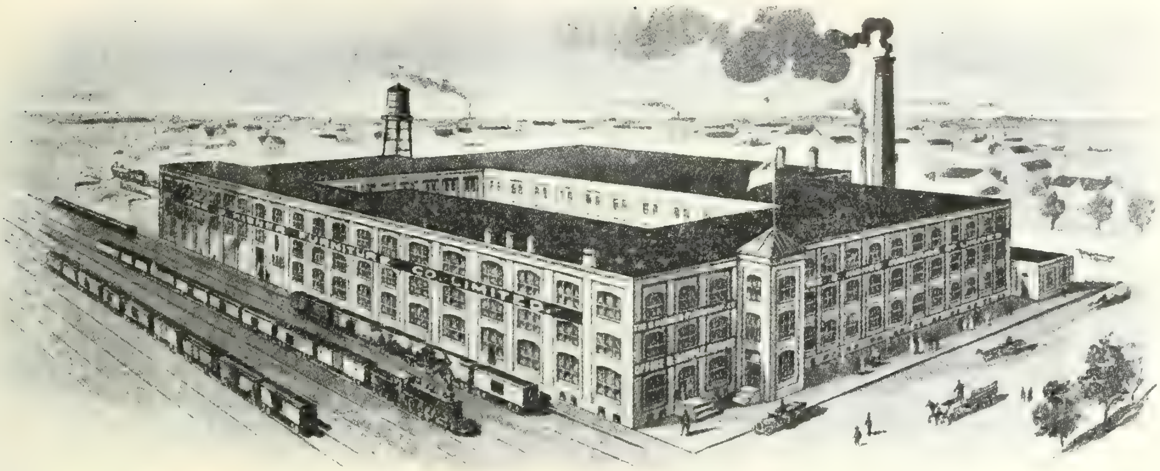
Here are a few people who are using our machines :—

The Robert Simpson Co., Toronto (complete outfit).
T. P. Stewart, Oriole Rd., Toronto (2 machines).
A. & A. Grant, Logan Ave., Toronto (2 machines).
Moore Bros., Wychwood, Toronto (2 machines).
E. E. Woodley, 158 Davenport Road, Toronto (2 machines).
J. J. Walsh, Toronto.
Rutherford & Sons, Montreal, Que.
Thos. Light, 295 McKay Street, Montreal, Que.
Bennet & Thraite, Hamilton, Ont.
J. Usher, Northumberland Street, Brantford, Ont.
The Hudson Bay Construction Dept., Edmonton and Calgary (3 machines).
and nearly four hundred others.

Do not make any mistake, but write now for catalog and price list, etc.

The Elliot Woodworker, Limited

College and Bathurst Sts. - - TORONTO, ONT.



ACTORIES AT BERLIN & LISTOWEL

ESTABLISHED 1877.

THE D. HIBNER FURNITURE CO., LIMITED.

MANUFACTURERS OF

HIGH GRADE FURNITURE, COMPLETE DININGROOM SUITES IN OAK & SOLID MAHOGANY,
PARLOR & LIBRARY TABLES, SECTIONAL BOOK CASES & PARLOR SUITES.

BERLIN, ONTARIO,
CANADA.

April 29th, 1914

The Canadian Linderman Co.
Woodstock, Ont.

Gentlemen :—

Our Linderman six-foot Dovetailer has been running at our factory for over six months. During that time we have used it on all grades and classes of work, from Solid Mahogany Table Tops to core work, drawer sides, etc., and we can truthfully say that the machine has fulfilled every promise that you made us about it. Our joints are as fine as we could ask, and we have had no trouble with the machine since we installed it.

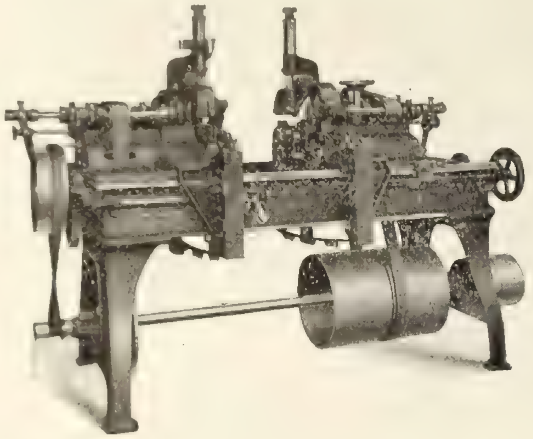
We wish to thank you for the interest you have taken in our machine, and we surely appreciate the attention.

Yours very truly,

THE D. HIBNER FURNITURE CO., LTD.

D. Hibner President

That New Spoke Machine

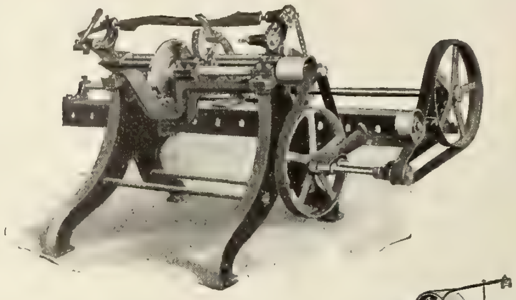


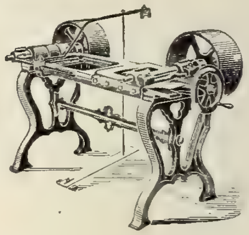
The big wheel manufacturers are putting them in fast.

Don't you be the last one. The machine is a great money saver.

Get it NOW.

J. M. NASH, Milwaukee, Wis.





Start a Business of Your Own

The **"OBER" Line of Handle Machinery** will help you.

Lathes, Sanders, Rip Saws, Cut-Off Saws, Bolting Saws, Etc., for getting out **Handles** of various kinds, **Whiffletrees, Neck Yokes, Spokes, Ball Bats, Spindles** and **variety work.**

OBER Machines are **moderate in cost, easy to operate, strong and durable.**

Write for free information and catalogue No. 31

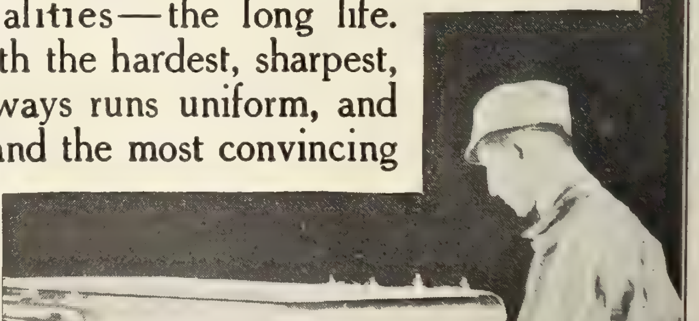
THE OBER MFG. CO.
CHAGRIN FALLS, O., U.S.A.

CARBORUNDUM BRAND GARNET PRODUCTS

THE better the output of a wood-working plant, the more efficient the sanding equipment, the more certain it is that they are using Carborundum Brand Garnet Paper and Cloth, whether it is the Carborundum Brand Paper, or Cloth, in sheets, rolls, or belts, they have the same clean, quick-cutting qualities—the long life. Every inch is uniformly coated with the hardest, sharpest, of Garnet grain—the grading always runs uniform, and the paper, cloth, and glue must stand the most convincing tests of quality.

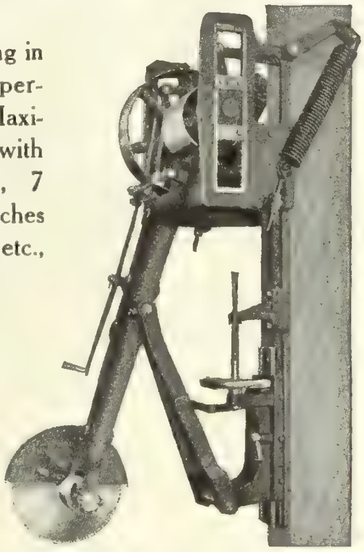
Samples for trial whenever you write

THE CARBORUNDUM COMPANY
WORKS:
NIAGARA FALLS, N. Y., U. S. A.
REISHOLZ DÜSSELDORF MANCHESTER, ENG.
STORES:
NEW YORK CHICAGO BOSTON PHILADELPHIA
CLEVELAND CINCINNATI LONDON, ENG.



Carborundum Brand Garnet Paper sanding table tops in the largest table factory in the world.

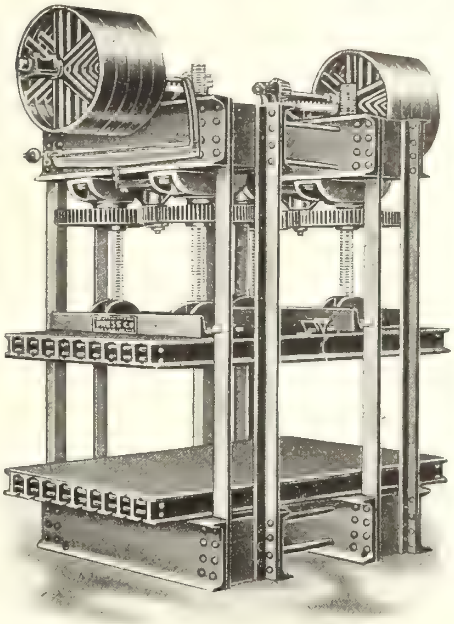
PRYIBIL No. 5 Parallel Saw and Groover



This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago
If interested in Woodworking Machinery, Write us.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL

Books For Sale

The following books are offered at special prices subject to previous sale:

Saw Fitting Manual, a treatise on the care of saws and knives. Deals with everything in the saw and knife alphabet, from adjustments to widths. 144 pages. Price $2.00.

Common-sense Handrailing, by Fred T. Hodgson. Published by Frederick J. Drake & Company, Chicago. 114 pages, illustrated. Price 50c.

Roof Framing Made Easy, by Owen B. Maginnis. Published by The Industrial Publication Company, New York. 164 pages, illustrated. Price 50c.

Handrailing Simplified, by An Experienced Architect. Published by William T. Comstock, New York, 52 pages, illustrated. Price 50c.

How to Join Mouldings; or, The Arts of Mitering and Coping, by Owen B. Maginnis. Published by William T. Comstock, New York. 72 pages, illustrated. Price 50c.

The Book of Lumber Shed Construction, by Met. L. Saley. Published by American Lumberman, Chicago. 176 pages, illustrated. Price $1.00.

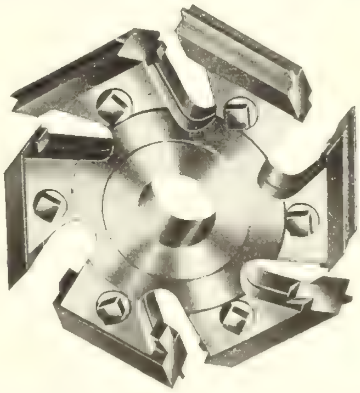
Furniture Designing and Draughting, by Alvan Crocker Nye. Published by William T. Comstock, New York. 100 pages, illustrated. Price $1.00.

Popular Mechanics Shop Notes, Published by Popular Mechanics, Chicago. Easy Ways to do Hard Things, etc. Years 1905-1906-1907-1908. Price 40c each.

Cabinet Making, by J. H. Rudd. Published by Grand Rapids Furniture Record Company. 210 pages, illustrated. Price $1.50.

Woodworker Publishing Company,
Nicholls Building, Limited
Toronto, - Ontario

Diehl Cutter Heads



Diehl Adjustable Cutter Heads are the ideal tool for the following work, glue joint, shaper, tenoning, jointing, sash, and door, ship lap, ceiling, flooring, wainscotting and variety wood work.

The Diehl Cutter Grinder is a machine indispensable to the successful operation of any woodworking plant.

Send for Catalogue

The Diehl Machine Works
Wabash, Ind., U. S. A.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

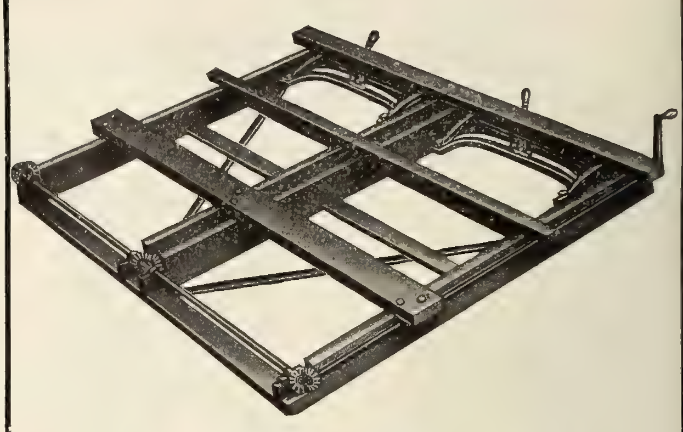
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

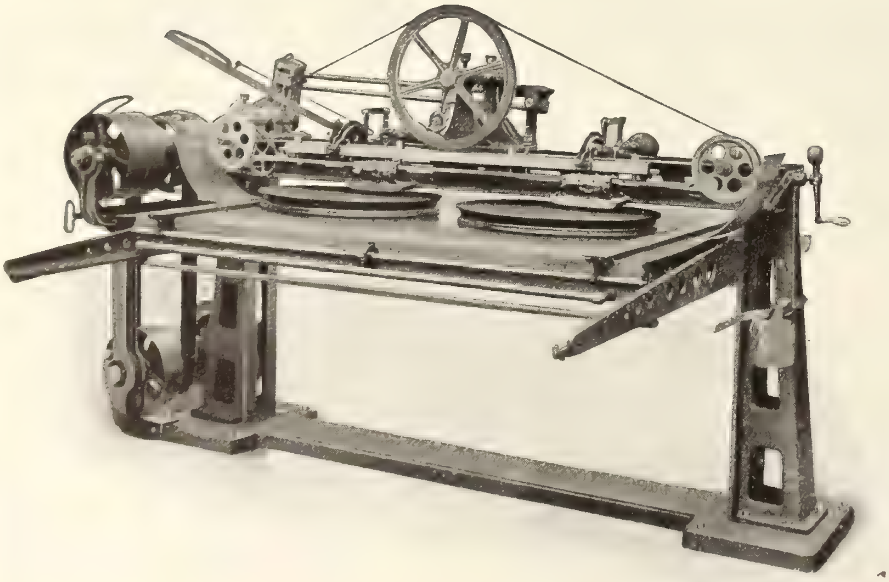
Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.

Moore Universal Rubbing Machine



The labor saving advantages of this machine are apparent in the accompaning illustration.

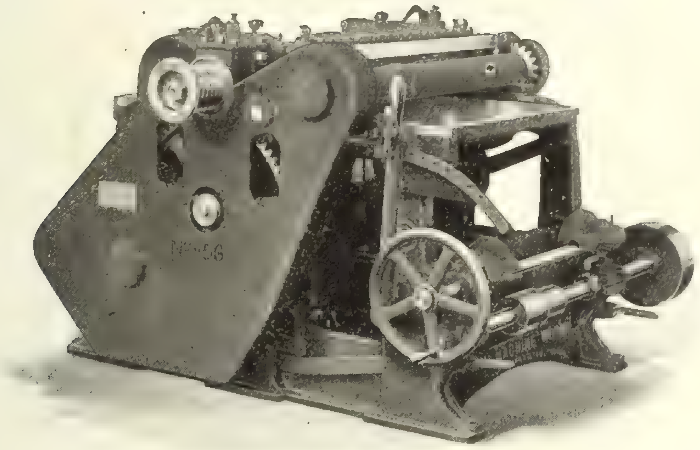
The action of a flexible guiding bar ensures a uniform finish throughout. Any required amount of pressure is obtained by an automatic device on the machine.

The accomodation of this machine is for cases up to 39 inches high or stock 6 feet by 8 feet.

The floor space required is 10 ft. x 10 ft. for the 8 foot machine and 10 ft. x 12 ft. for 10 foot machine.

May we send you literature?

CURTIS MACHINE CORPORATION, Jamestown, N. Y.



Berlin Surfacers

We have specialized in planing machines for years. Berlin surfacers represent the experience of all these years. You can make no mistake by putting your surfacing requirements up to us. We build surfacers for every purpose. Whatever surfacing you want to do may be done at lowest cost on Berlin.

Are Your Cabinet Surfacers Losing Money For You at the Sander?

Are you thinking of replacing or adding to your present surfacing equipment? Then judge the earning power of Berlin Surfacers by comparing them with others. Mail your card request for complete data now — so you'll have it for reference when you want it.

Don't depend on your sander to correct the inferior work of your surfacers. That isn't profitable. The inefficiency of one machine is handicapping the other.

Surface your stock on the Berlin "156" Single Cabinet Surfacer. Then once through at the sander will suffice. And instead of sanding two pieces at one time the uniformity of the surfacing will enable your sander operator to feed stock across the entire width of the machine. Its efficiency is increased 100 per cent. That assures profit, absolutely.

Equipped with round heads carrying thin steel knives, which may be ground and jointed on the machine, the "156" produces a finish that shines. Sanding all your stock won't be necessary.

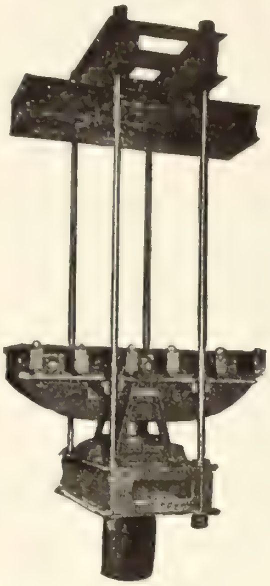
The sturdy construction and the use of only proven design features assures low upkeep cost. There'll be fewer necessary shut downs, less lost time. The top in-feed roll and chip-breaker may be sectional. The wedge method of bed adjustment assures its stability. Fine finish is therefore assured always.

BERLIN MACHINE WORKS LIMITED, Hamilton, Ont.

Largest Manufacturers of Woodworking Machinery in the World

UNITED STATES PLANT, - - - - - BELOIT, WISCONSIN

Hydraulic Veneer Press

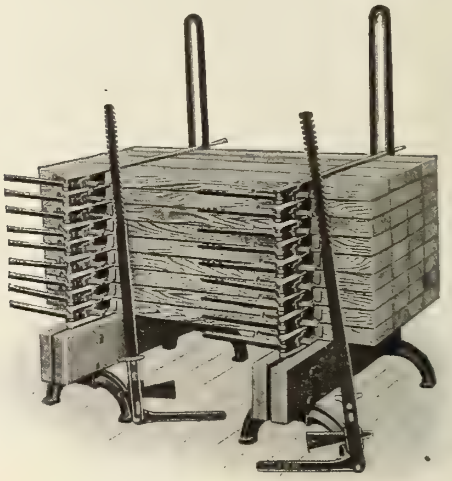


We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

CLAMPS THAT CLAMP



We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

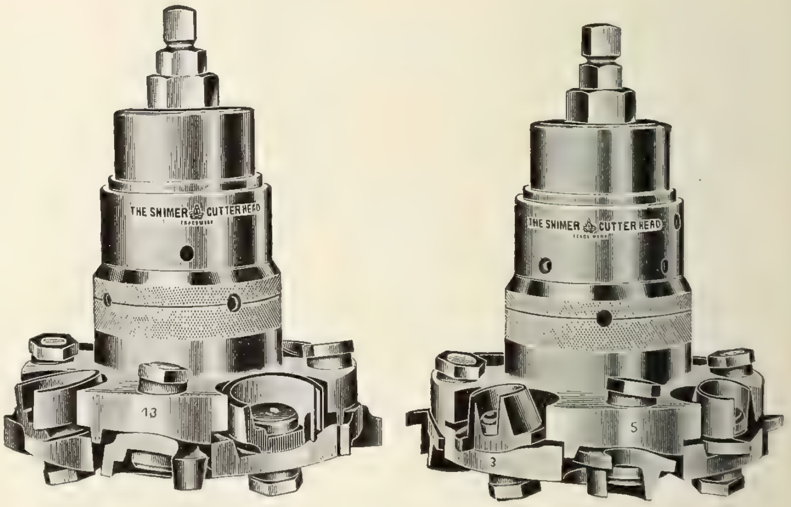
Send for Complete Catalogue

A. E. PALMER & SONS
OWOSSO, MICH.

Scientific Management

The mill man who does things in the quickest and easiest way is a Scientific Manager. Instead of trying to save pennies by using crude home-made appliances, and thereby losing dollars, he secures the best equipment of labor-saving tools possible, preventing the delays and annoyances which usually take up the time of the men.

He orders a full supply of Shimer Cutter Heads for matching tongue and groove, either single or double or both kinds; Heads for Ship Lap, Wainscoting, Jointing, or other purposes, and has them made interchangeable so that by merely slipping one set off the spindles and putting on the others, work of another character may be done without a change of machine guides. This enables his men to finish a job while the man who shapes his own cutters is getting ready to begin work.



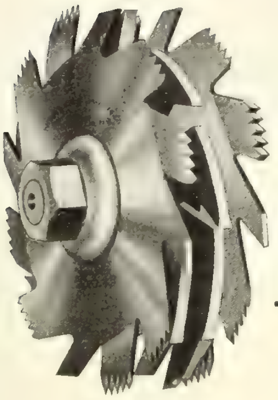
The Shimer Limited with Expansion
Price, net, for flooring, $72.46 the set, complete.

Shimer Cutter Heads are designed and constructed to do things in the quickest and easiest way and to secure the best results. The make-ready built into them saves the time of the men in getting started on a job. The Divided Shearing Cut insures easy and fast cutting. The shape of the Bit and manner of seating on the Head insures only the cutting edges touching the lumber. The Expansion feature enables the operator to right up slight differences in fit of tongue in groove in an instant of time.

These and other special features of the Shimer Cutter Heads are quickly made manifest to the Scientific Manager and have been the means of placing in the mills of this and other countries over 188,000 Shimer Cutter Heads.

It will pay you to fall in line. Write us today in reference to any planing mill troubles you may have.

Address: SAMUEL J. SHIMER & SONS, Inc., GALT, Ontario, Can.



Patented Nov. 29, 1890
July 19, 1912

A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

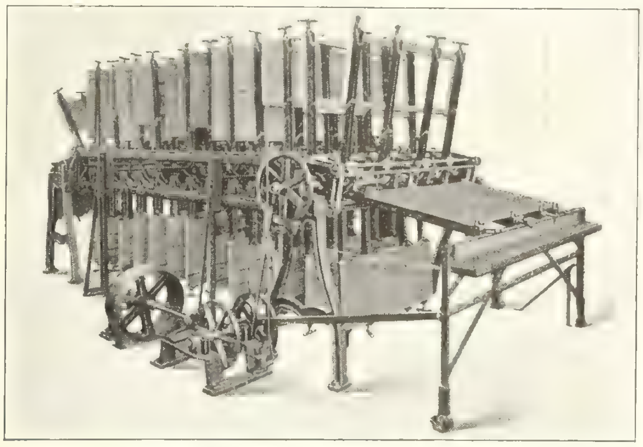
A. R. Williams Machy. Co. Toronto — Canadian Agents — Williams & Wilson Montreal

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

I AM THE MAKER

of the

Billstrom Gluing Clamp Carrier



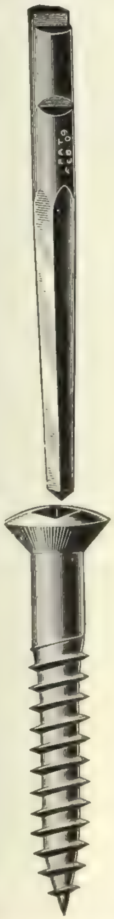
Over 250 in successful operation in the United States, Canada, England and Germany.

Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

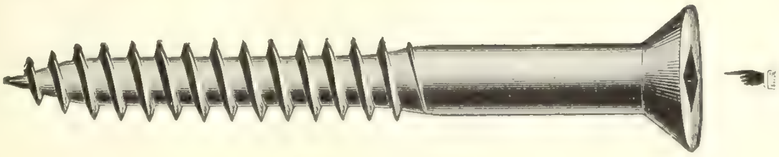
It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.



ROBERTSON SOCKET HEAD

Wood Screws



See That Square Hole

Pat. Feb. 2, 1909

THIS IS A REAL WOOD SCREW

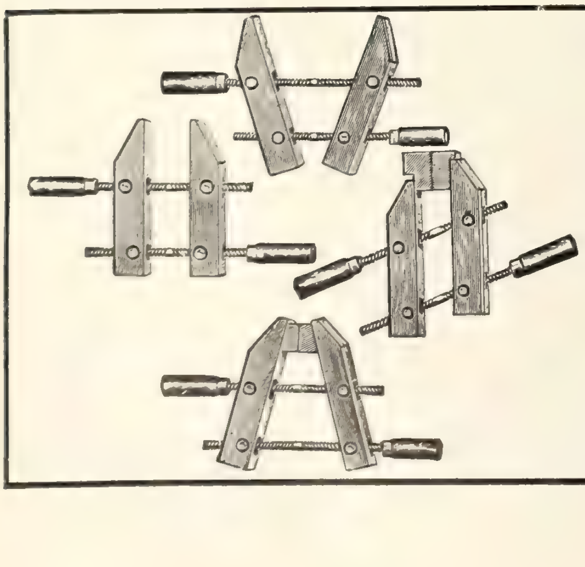
It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO

Alphabetical List of Advertisers

Acme Veneer & Lumber Company	51
Adjustable Clamp Company	10
Andrews Company, A. H.	13
Archer Lumber Company	60
Atlantic Lumber Company	59
Ault & Wiborg Company	45
Berlin Machine Works	7
Billstrom, Nels. J.	9
Black Bros. Machinery Company	13
Buffalo Tool & Supply Company	
Canada Machinery Corporation	14
Canadian Boomer & Boschert Mfg. Co.	5
Canadian Linderman Company	3
Canadian Morehead Manufacturing Company	
Carborundum Company	4
Central Veneer Company	52
Central Veneer Company	54
Chapman Double Ball Bearing Company	66
Chicago Machinery Exchange Inc.	13
Cincinnati Veneer Company	53
Clark Veneer Company, Walter	52
Curtis Machine Corporation	6
Cyclone Blow Pipe Company	12
Dennison, Herbert, J. S.	57
DeVilbiss Manufacturing Company	45
Diehl Machine Works, G. M.	5
Dominion Mahogany & Veneer Company	55
Duhlmeier Brothers	63
Elliot Woodworker, Limited	2
Galt Knife Works	11
German American Stain Company	43
Goshen Veneer Company	53
Grand Rapids Hand Screw Company	6
Grand Rapids Veneer Works	59
Haughton Veneer Company	49
Hoffman Bros. Company	49
Huddleston-Marsh Company	53
Huther Bros.	9
Imperial Lumber Company	63
Invincible Blow Pipe Company	12
Jamieson & Company, R. C.	44
Keiths Limited	13
Kosse, Shoe & Schleyer Company	62
Licking River Lumber Company	61
Lightfoot, Stanley	57
Marrietta Paint & Color Company	68
Meakins & Sons	43
Morton Dry Kiln Company	
Mowbray & Robinson	62
Nash, J. M.	4
National Process Company	67
National Securities Corporation	57
National Veneer & Lumber Company	52
Ober Manufacturing Company	4
Ohio Veneer Company	49
Palmer & Sons, A. E.	8
Penrod Walnut & Veneer Company	54
Perkins Glue Company	67
Perrin & Company	8
Petrie, Limited, H. W.	1
Powell-Myers Lumber Company	61
Prendergast Company	62
Pryibil Machine Company, P.	5
Reflector & Hardware Specialty Mfg. Company	60
Robertson Manufacturing Company, P. L.	9
Saw Mill Owners Sales Company	58
Schmidt Company	45
Scientific American	57
Scrim Lumber Company, W. G.	59
Shawnee Lumber Company	63
Sheldons Limited	12
Shiels & Company, Chas. F.	62
Shimer & Sons, Samuel J.	8
Simonds Canada Saw Company	
Smith & Phillips Manufacturing Company	60
Spencer, C. A.	59
Standard Dry Kiln Company	67
Stevens & Jarvis Lumber Company	59
Stewart Greer Lumber Company	60
Strong Veneer Company	6
Talbot-Zoller Lumber & Veneer Company	62
Thompson & Company, Lewis	52
Thompson Veneer Company, W. T.	49
Thompson Hardwood Lumber Company	63
U. S. Steel Tank & Pipe Company	12
Walters & Sons, H.	11
Wardell Manufacturing Company	
Whitney & Son, Baxter D.	
Wilcox & Knapp	59
Young & Cutsinger	61



The Jorgensen Adjustable

is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company

215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng., Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.

Good Steel, Carefully Manufactured
Scientifically Tempered

Our
Glue
Joint
Cutters

Make a Perfect
Joint

Milled
Shaper
Cutters

Any Size or
Any Shape

Ask for Quotations

Galt Knife Company, Limited
GALT 99 State Street ONTARIO

MACHINE KNIVES

To get the greatest quantity of work from your machines you should buy your planer knives on quality. A good knife will do more and better work and be far cheaper in the end than a poor one.

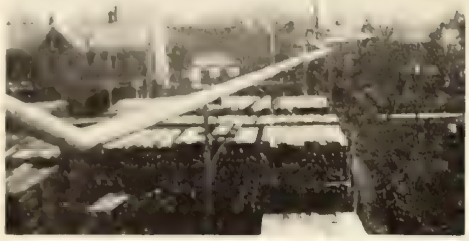
Our knives give uniformity of dimensions, uniformity of finish and are uniform in temper.

Our Guarantee. All our knives are fully warranted and will be replaced if found defective through any fault of ours.

Prices of any kind of machine knives quoted on application.

May we quote you?

H. Walters & Sons, Limited
Hull, Quebec



Slow Speed Low Power Shaving and Dust Collecting Systems

New Systems designed. Old systems corrected.
Long distance blows a specialty.

Trained Mechanics. We know how.

Consult our Expert

INVINCIBLE BLOW PIPE CO.
CHICAGO 176 George St., TORONTO

LOOK
AT
THESE PRICES

Slow Speed Fans		Collectors	
Size	Price	Size	Price
30	$ 55.00	14	$ 60.00
35	70.00	16	75.00
40	90.00	18	90.00
45	115.00	20	100.00
50	150.00	22	110.00
55	185.00	24	120.00
60	250.00	26	140.00
70	325.00	30	175.00
80	400.00	34	200.00

With liberal discounts.

U.S. Steel Tank & Pipe Co.
2090 Canalport Ave. CHICAGO

Maximum Service

Minimum Repairs

The design of our **Shaving Exhaust Fan** is the result of many years experience, and can be depended on for reliable and efficient service. It has a saving in power and speed of 25% to 40%, and fitted with Ring Oiling and Self Adjusting Bearings.

We also manufacture Lumber Dry Kilns, Cars, Heating and Ventilating Appliances, Steam Specialties, etc.

SHELDONS LIMITED - Galt, Ont.
Toronto Office, 609 Kent Building

— Agents —
Messrs. Ross & Greig, 416 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

(Patented)

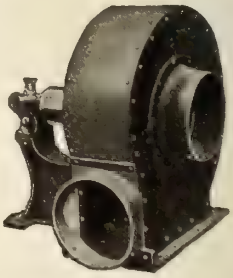
Cyclone Blow Pipe Co.

Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.



WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

"ANDREWS"
Condensing Moist Air
Lumber Driers
Are Always On the Job

Changes in Barometer pressure, Wind pressure or Wind Direction cannot affect the drying of the lumber in the

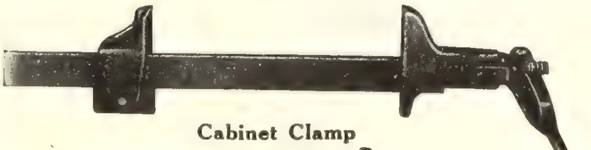
"Andrews" Condensing Kilns

Lumber dried in these Kilns is of uniform dryness, soft in texture and as free from Checks and Honeycombs as when put into the Kiln and it may be dried faster than any in other kiln.

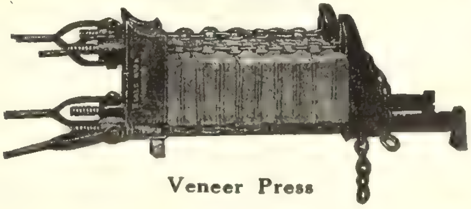
Information for the asking

DRIER DEPARTMENT
The
A. H. Andrews Co.
115-117 S. Wabash Ave.
CHICAGO, ILL.

"Pioneer" Moulding Sander
Power Veneer Presses

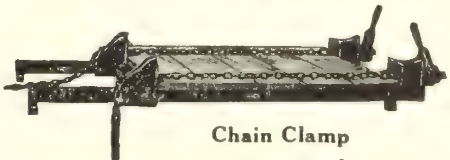


Cabinet Clamp



Veneer Press

Write for
Catalogue
and Prices



Chain Clamp

Black Bros.
Machinery Co.
Mendota, Ill.

Column Clamp

Keiths LIMITED

Automatic Sprinklers

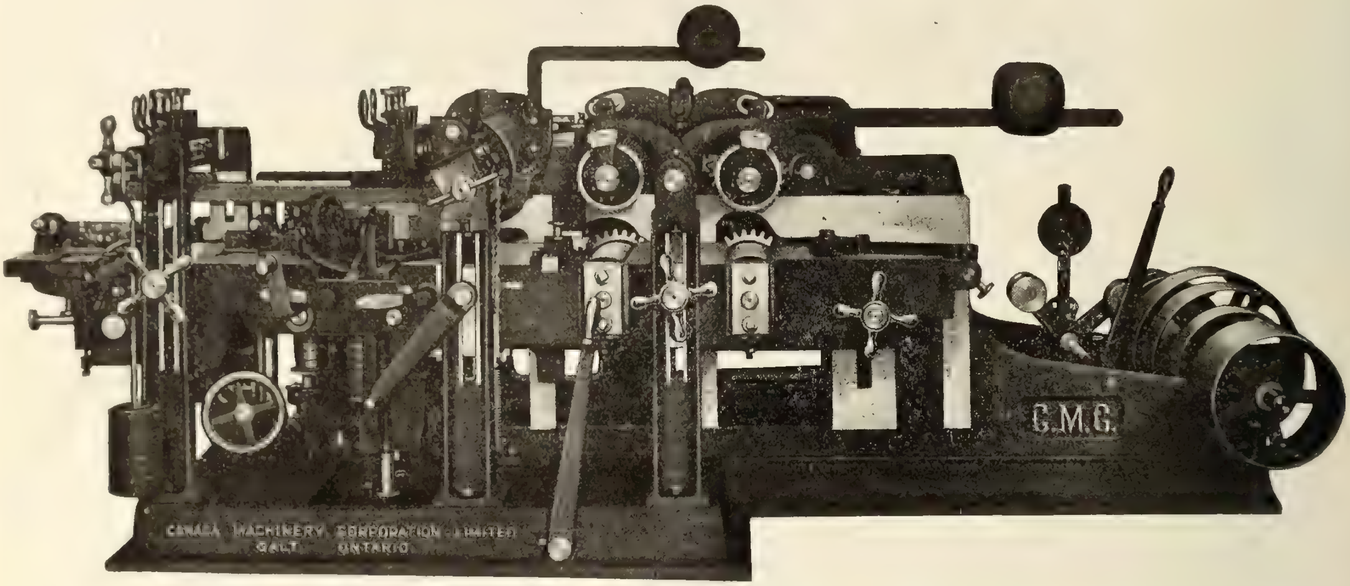
WILL YOU LET US SEND YOU
AN EXPERT FREE OF CHARGE

to show you the best investment you ever made. Many Sprinkler Systems are paying their Owners 50% per annum return on the investment in reduced insurance premiums, and in addition are affording almost perfect protection against loss by fire due to interruption of business

297 Campbell Ave., TORONTO
707 New Birks Bldg., MONTREAL

Associated Automatic
Fire Sprinkler

12" Moulder **C.M.C.** **12" Moulder**



12" HEAVY DUTY FOURSIDED MOULDER

59 of these moulders in successful and satisfactory daily operation in Canada.

This is our latest type of heavy, outside moulder, mounted on a substantial base, and is one which we thoroughly recommend for all classes of work. It is heavy and substantial in all parts and capable of doing the finest work, while at the same time it is extremely convenient in adjustment and can be set up for any job in a minimum time.

We have paid particular attention to the feed, and believe we have here a machine with a stronger and more powerful feed than any other of its type. We have also paid special attention to guarding the machine wherever possible, to insure safety of the operators.

It is built in two sizes to work 10″ and 12″ wide.

Bulletin No. 303 fully describing this machine sent on request.

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring,
woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.

Nicholls Building, Toronto
Phone Ade. 929

Vol. 14 July, 1914 No. 7

The Problem of Procuring Better Workmen

THE letter relating to technical training at Calgary, contributed to this issue by Mr. T. B. Kidner, directs attention afresh to the facilities (some of our readers would say, lack of facilities) provided woodworkers for obtaining technical training in the trades.

Some years ago Ontario started a movement in industrial training which has now reached some of the Western Provinces, but much—inestimably much, remains to be done. In Calgary, which is quite a young city, it is gratifying to find that successful classes for woodworkers have been held for the last three years and that manual training rooms are open to those who wish to avail themselves of the opportunities offering. It is encouraging to find that provision is being made for establishing at Calgary a vocational high school wherein will be made ample provision for shop instruction. The programme to be undertaken should be of much practical worth to woodworkers.

Mr. Kidner sounds an important note when he expresses the hope that employers of woodworking factories will co-operate in the effort that is being made by the city authorities to provide practical courses in woodworking subjects. Without a fair measure of such co-operation, little success can be expected. We hear a great many complaints about the difficulty of securing properly trained mechanics, but there are few enough suggestions as to real constructive work in the way of turning them out. Manufacturers lament the fact that men competent to take positions as foremen and fill them creditably are as scarce as oases in the desert. It is regrettable that this is largely true, but it is more regrettable that these same manufacturers do not look into the question rather more deeply. Prior to the present depression, the woodworking community, in common with the constructional interests at large, passed through a period of unexampled prosperity, and in a general way there has been no excuse for there having been no effort made to improve the status of the industry by providing better woodworking schools in the important cities and larger towns. It is just a question of dollars and cents. It is not to be expected that the local authorities will come forward and urge the institution of these classes and it is certain that the wherewithal for them will not be provided by any supernatural agency. Interest in woodworking classes, we must take it, is confined to this mundane sphere.

There is no reason why the woodworking trades should not enjoy the best practical training facilities in the country. There is no excuse for there not being up-to-date classes and well-equipped training shops in every large centre. It must be borne in mind that it is by means of the technical school only that a higher standard of workmanship can possibly be attained.

None of us will dispute the truth of the assertion, "There is no royal road to learning." Few of us, in this scientific day, will argue that training can be "picked up." A man cannot "pick up" a trade and be expert in its details and scientific in its application.

The technical school is designed to promote the interests of men especially adapted for practical work. At the head of many of our woodworking institutions there are men strong in executive ability, quite capable of discharging the duties incumbent upon business heads. The real need is for men strong in technical detail—men who can be relied upon to attend to matters both small and great in the operation of the plant with ability, care and promptitude. Careful technical training produces men who are the backbone of every industry.

The small start that Calgary has obtained is deserving of recognition and it is to be hoped that her example will be emulated and her achievements surpassed. The Canadian Woodworker commits itself unhesitatingly to a policy of expansion in this field and urges its readers to take a practical interest in the problem of procuring better workmen—an interest which will resolve itself later into real money.

If we are to establish a reputation for the finished product we cannot make a side issue of the man who turns out the work.

New Brunswick as a Field for the Furniture Manufacturer

THERE is a well-grounded belief among a large proportion of the people of New Brunswick that the furniture woods of that province lend themselves in no small measure to development in many important directions and that these woods, notably birch, beech and maple, are particularly well-adapted for furniture manufacture. In this view they have the unqualified support of no less an authority on high-class furniture than Mr. C. T. Currelly, Director of the Royal Ontario Museum of Archaeology.

The primary object of the Museum is to secure the best examples of ancient and modern industrial art and to bring them within reach of manufacturers looking for new designs. As an authority on the historical and other aspects of furniture design, Mr. Currelly has proved his ability to develop the educative side of period furniture, as witness the many rare examples which find a place in the Museum to-day. Many of these specimen designs would furnish excellent material for reproduction in our furniture factories.

Mr. Currelly has imparted some valuable hints with regard to the tendency in furniture designs. He says that the farthest point in the matter of plain furniture has been reached, and that for some years to come, at least, there will be an increasing demand for the ornamental.

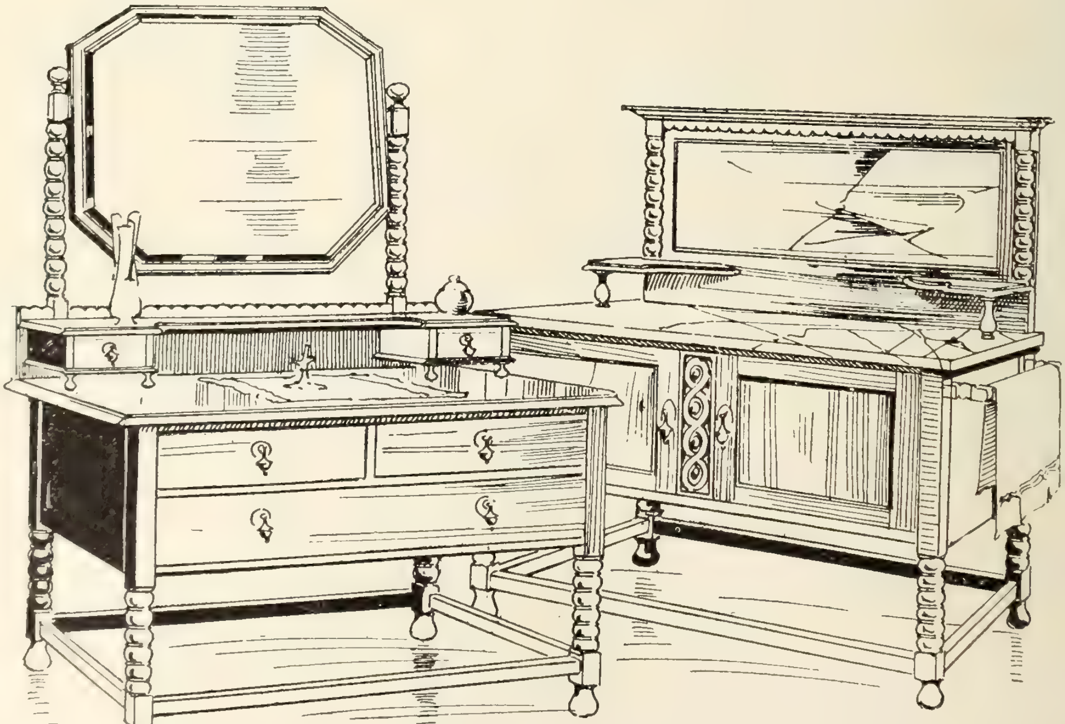
There can be no doubt that wide-awake furniture manufacturers are showing increased interest in the manufacture of antique designs. This is indicated in the visit made to New Brunswick recently, by the representatives of a large manufacturing concern who purchased a number of articles of antique furniture for the purpose of reproducing them in their factory. One lady, a resident in St. Andrews, is said to have been offered $1,600 for an old-fashioned sideboard, which, needless to say, she refused on the ground that the furniture was a family heirloom. It is contended by enterprising furniture enthusiasts in New Brunswick that designs of this character should be available for Canadian manufacturers, particularly for those who begin operations in New Brunswick. Since there is no industrial museum in the Maritime Provinces, it is suggested that it would be a good idea for the Provincial Government to secure designs of this class of material. Such designs might well be of much practical and commercial value to New Brunswick furniture men.

The Practical Part in Furniture Making[*]

THE shield backs in chairs which were so popular during the Georgian period were designed by both Heppelwhite and Sheraton. While the shield was used by both great designers, there is a characteristic difference between them which enables one to distinguish them at a glance. The curve of the top rail of the Sheraton shield is always broken with a straight line. In other words, the top rail is made up of two concave curves connected by a straight line at the top. Heppelwhite, on the other hand, invariably used a continuous or unbroken curve. The shield backs of both designers usually had a decorative splat, though sometimes this was omitted and the back caned. This splat was jig-sawed and carved into such conventions as the wheat sheaf, the Prince of Wales plume, vase and others.

Apparently, these chairs are made of a shield supported upon short back posts. It is evident that if such were the method of construction, the back would be weak at the joint thus formed. Shield back chairs are no exception to the general rule which requires that the back legs reach from the floor to the top rail in the back.

The general dimensions for chairs of this style, as given by Heppelwhite himself, are: "Width in front,

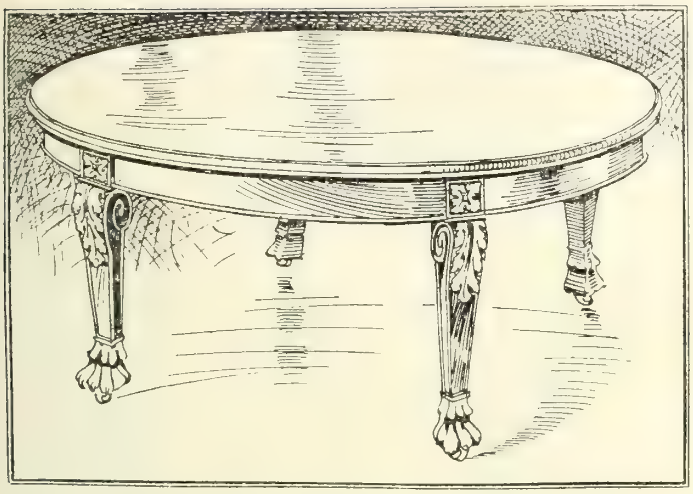


The illustrations shown on these pages are reproduced by courtesy of The Furniture Record. They represent some of the leading lines being manufactured in European furniture factories.

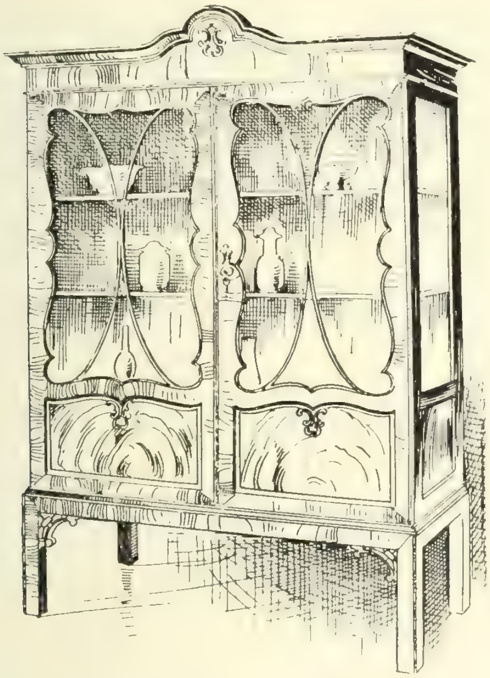
The design shown above is for a Jacobean bedroom suite. For simplicity of design and excellence of finish the pieces are particularly attractive.

---

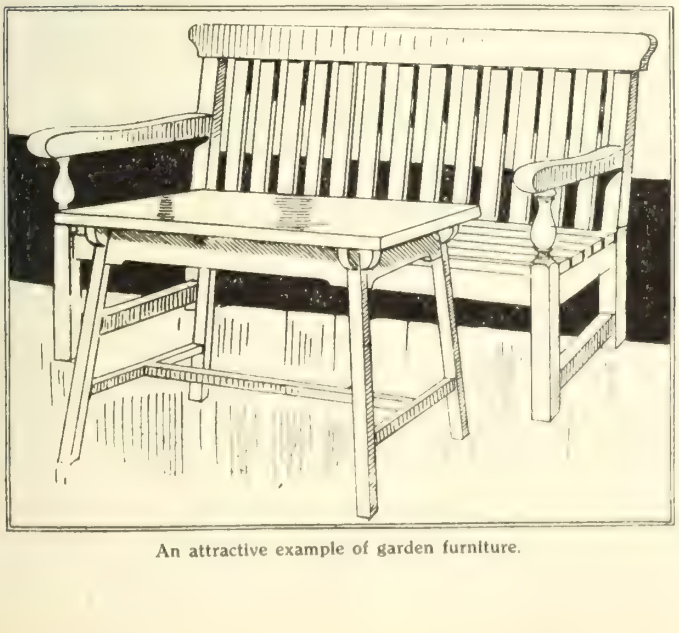
[*] By C. A. Zuppann, in the Furniture Manufacturer and Artisan.



A handsome Chippendale mahogany circular dining table. The carved work on the legs is an interesting feature of this design.



This antique mahogany cabinet in the Chippendale style is a particularly handsome piece of furniture. It has carved ornaments on the pediment and panels and is beautifully finished. The graceful lines of this cabinet are characteristic of the cabinet maker's art.



An attractive example of garden furniture.

20 inches; depth, 17 inches; height of seat frame, 17 inches; total height, about 3 feet 1 inch." The upholstering brings the seat height to 18 inches. These dimensions are followed approximately in our modern reproductions. In the modern chairs, opinion seems divided as to whether the top rail of the shield should be curved to fit the back or made straight. Some manufacturers use the one method and some the other. All agree, however, on having the shield curved or back fitting from the top to bottom.

That a creditable result may be accomplished in the construction of shield back chairs by many high school boys will be admitted after a trial. It is, however, beyond the ability of a beginner, and unless the pupil shows exceptional aptitude, he should not be encouraged to attempt it. A mastery of the band-saw and jig-saw is necessary, unless the time consumed in construction is of no consequence. A careful boy understanding these machines and the use of bench tools should have no great difficulty.

It is absolutely essential that a full-size detail be made for the working drawing. The accompanying scale drawing may be copied full size or modifications may be made if the ability of the student permits. The curved parts are set off in one-inch squares. By noting where the curves cross the lines forming these squares and transferring this to the full-size detail, under construction, a series of points will be obtained which can be drawn into smooth curves. Care must be taken to get the inside and outside curves of the shield parallel. Draw one curve as desired and lay off the second curve from this. Always measure on a line drawn perpendicular to a tangent at the point of measurement. Needless to say, this tangent and the perpendicular do not need to be drawn in.

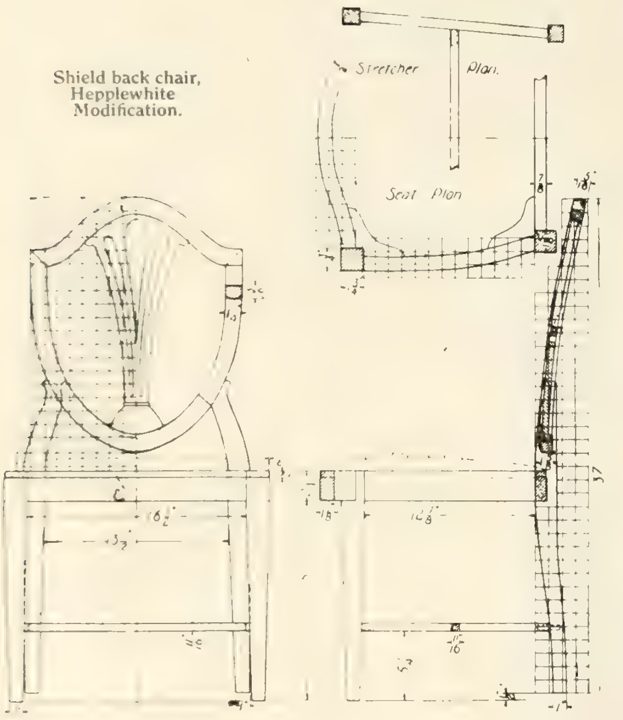
Two methods of joining the top rail to the back legs are shown. The one on the left is a plain miter, doweled with two ¼-inch dowels. The one on the right is a butt joint secured with one ⅜-inch or 7/16-inch dowel. Also two different joints are shown for the lower rail in the back. Each of these is secured by a ⅜-inch dowel. The student must select the joints desired and make his detail accordingly. All of these joints are used by manufacturers today. The miter for the top rail is, perhaps, the neater joint, but it is also much harder to construct. The butt joint is easier to construct, just as strong, and after the stock is moulded to shape, forming an apparent miter, the joining is scarcely noticeable even upon close examination. Of the joints for the bottom rail, the one on the left is, perhaps, stronger and is very little harder to make than the other.

In making the stock bill, the butt joint has been selected for the top rail and the left joint on the detail for the bottom rail. If other joints are used, allowance must be made accordingly. Also the stock for the back legs is considered as made from squared-up stock of sufficient dimensions to enable the student to saw out without blocking. While this is by far the easier method, it is also wasteful, and if desired a block may be sawed from what would be waste on one side of the leg and added where needed to the other side, thus using stock of smaller dimensions. Of course, this must be done before band-sawing. While this later method would be factory practice and as such should be explained to the pupil, it is not strongly recommended for school work where safety is the first consideration and where the machine is often all one cares to allow the pupil for use.

The corner blocks must not be designed large enough to interfere with the springs which later go into the seat. With these points in mind, an accept-able working drawing should be forthcoming. It will not be necessary to draw the full front view of the chair, as a half view will give all of the detail.

The next item should be a carefully made up stock bill. In the one accompanying this article, no account has been taken of glued-up stock. This has just been mentioned in the case of the back legs. The front seat rail offers another illustration. This may be built up in horizontal layers, sawed out and veneered on the face if desired. In this case the blocks band-sawed from front and back would be used as forms or cauls. Of course, these would be padded with blotting paper or something of similar nature before using.

Patterns for the band-sawing should now receive consideration. These patterns may be made of stiff paper, cardboard, or if desired in laying them out in order that enough stock be left at the joints. The splat and back legs will each need two patterns, though the other band-sawed parts need but one each. The top and bottom rail in the back can be shaped to the curve of the back by hand. These patterns must be carefully smoothed, as a great deal depends upon their accuracy. To transfer the curves from the detail to the pattern stock, use tracing paper and a very soft pencil, first tracing the curve, then reversing upon the stock and going over the lines again, which will, of course, cause a noticeable line to be left on the stock. In making the patterns, if a curved back fitting top rail is wanted, a pattern with a 21-inch radius for the arc will be needed. This, however, is not advised, as it considerably complicates the work.


Shield back chair,
Hepplewhite
Modification.

The actual construction may now be commenced. After all stock is gotten out to the rough size given in the stock bill, which allows one inch in length and ¼-inch in width for finishing, the patterns should be laid out on the different parts with pencil, carefully tracing around each pattern. Band-saw on the outside of these lines. If care is taken not to run the saw out of the stock, but to leave the waste attached, it will be found easier for the student to saw out the adjoining surface, as he will thus have a solid foundation or cradle for the stock and also will have the marked surface in its proper position. It will be found far better, also, to err by leaving too much stock than by sawing inside of the lines. The inside curves of the splat should be jig-sawed before the band-sawing is done on this piece. After the jig-sawing, the stock should be placed on edge and the curve of the back carefully sawed. The waste stock should now be nailed back in its original position and the remaining pattern band-sawed to shape. The bead is band-sawed on the splat and not glued on afterward.

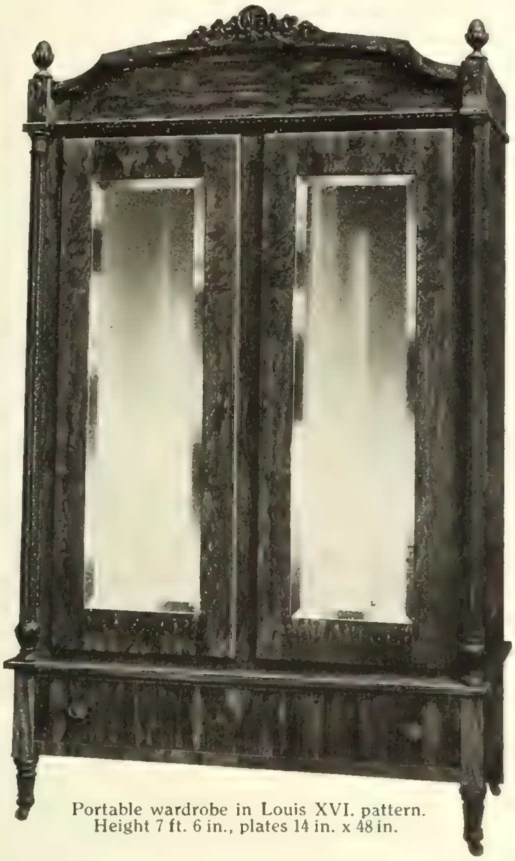
When all band-sawing has been finished, the pieces should be planed and spoke shaved to shape, regulating with file when necessary. The bead should be shaped with a chisel. The joints in the back should be carefully trimmed out with a chisel. Mark off the mortises in the top and bottom rail in back with the marking gauge and cut with a ¼-inch chisel. The tenons on the splat may be marked with a knife at this time, but a safer method would be to mark them after the rest of the back has been temporarily assembled, at which time the length of the tenon can be determined with more accuracy.

When all parts are finished, lay off the dowel holes in the rails and bore ⅜-inch holes, as indicated. Using dowel markers, mark off the holes in legs—front and back—and bore these for dowels. The seat rails fit flush with the front legs, but the side seat rails are set in ⅛-inch on the back leg. It is presupposed that in sawing, the angles on the ends of the rails have been accurately cut. Fit the chair together and inspect the work. Mark off and cut the tenons on the splat. Fit the stretchers and bore for dowels. The angles at which to saw the stretchers are gotten from the stretcher plan and the side view. The side stretchers are cut at both a horizontal and a vertical angle. The middle stretcher at a horizontal angle only.

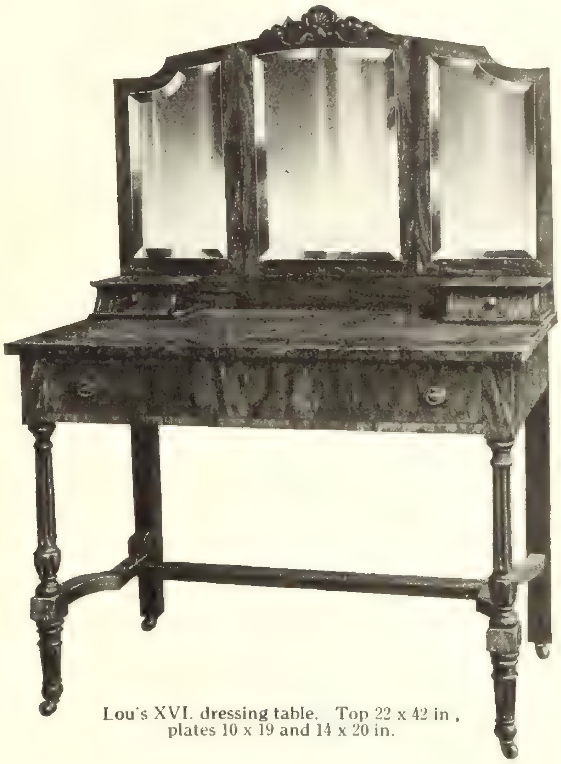
The seat rails are now to be rabbitted ½-inch by 1/16-inch for the upholstery. This can be done by gauging deep and cutting out with a chisel or can be done very easily on the shaper. Round the shield to the section shown and carve out back post where it runs into the shield. The shape is shown in the detail by the dotted line. Notch out front posts for upholstery, carrying the line of the rabbitt in the rails entirely around the front posts. Saw out corner blocks, being sure that the correct angle is secured.

Glue up the front legs and front seat rail, also the entire back. In clamping these parts together, great care must be taken, as the curved rails will tend to spring if clamped too tight, thus opening the joints and spoiling the entire job. When the glue has set, the rest of the chair may be assembled and corner blocks glued and screwed in place. Go over all parts, scraping off any excess glue and then sandpaper smooth first with medium, then with fine sandpaper. Do not sandpaper across grain at any place. After all marks are out and a good surface is obtained, the finishing may be undertaken.

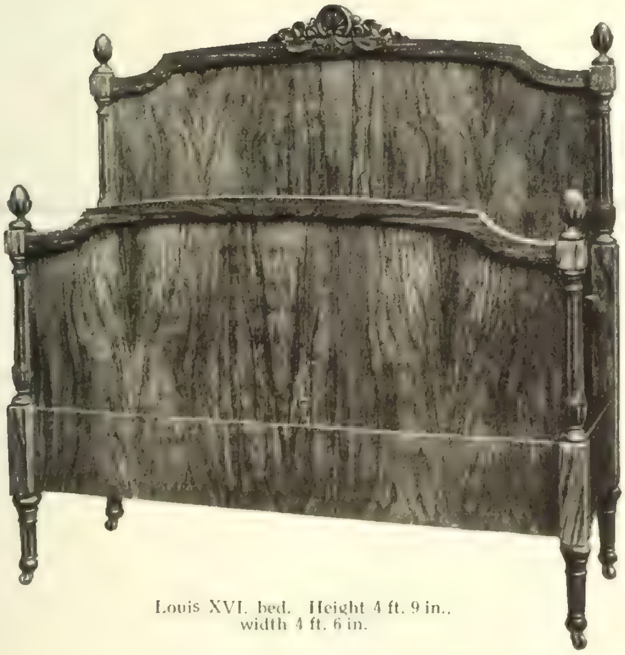
A stain suitable for this design may be bought mixed and ready for use from stain manufacturers advertising in this magazine. Usually these prepared stains are made with spirits in some form as the medium. These same firms also sell stain in powder form, which can be dissolved by the purchaser in water or spirits, as the nature of the powder requires. The acid anilines are "water stains," and will be found to produce excellent results. Purchase mahogany brown and mahogany red. Then dissolve a small quantity of each in separate vessels of water. The proportions will be given by the company from which the powder is purchased. Mix together in a third vessel a quantity of the dissolved brown and red, adding of one or



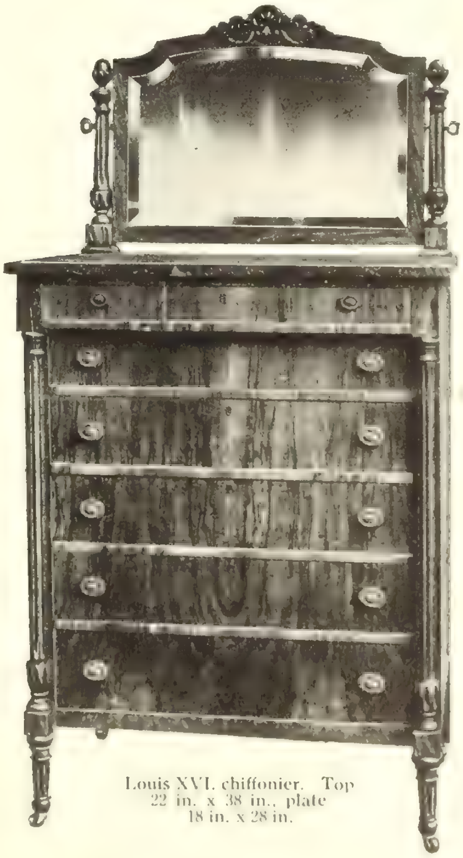
Portable wardrobe in Louis XVI. pattern. Height 7 ft. 6 in., plates 14 in. x 48 in.



Louis XVI. dressing table. Top 22 x 42 in., plates 10 x 19 and 14 x 20 in.



Louis XVI. bed. Height 4 ft. 9 in., width 4 ft. 6 in.



Louis XVI. chiffonier. Top 22 in. x 38 in., plate 18 in. x 28 in.

Some New Designs in Chamber Suites, Executed in Circassian Walnut by the Karges Furniture Company, Evansville, Ind.

Reproduced by Courtesy of The Furniture Industry.

the other until the desired shade of mahogany is produced. Keep an accurate account of the quantities used for future reference.

Coat some test strips with the stain and when dry finish with shellac. If the finished shade is not just what is desired, change the proportions of red and brown in the stain. The advantages of the water stain are that any shade may be produced as desired and that the cost is much less than that of prepared stains. The prepared stains, however, do away with any bother of mixing.

If the water stain is used, sponge the entire chair with water, and sandpaper again before applying stain. Apply the stain evenly. When dry, sand very lightly in order not to take off stain, and then shellac. Color some shellac with Bismark Brown and go over the light places. Sand lightly and again shellac. After sanding this second coat, the chair may be varnished or shellacked. Two coats of varnish should be applied if varnish finish is desired. The last coat should be rubbed with pumice and afterward with oil and rottenstone.

STOCK BILL OF SHIELD-BACK CHAIR

ITEM	NO.	NAME	STOCK	ROUGH SIZE, INCHES		
				Long	Wide	Thick
1	2	Back legs	Mahogany	33	3½	3
2	2	Front legs	"	18¼	2	2
3	1	Top rail in back	"	17	5½	1⅛
4	1	Bottom rail in back	"	12½	5¾	1⅛
5	1	Splat	"	18¼	8	1½
6	1	Front seat rail	"	17½	3	2½
7	2	Side seat rails	"	14	2½	1¾
8	1	Back seat rail	"	14½	2½	1
9	2	Side stretchers	"	15¼	1	1
10	1	Middle stretcher	"	17¼	1	1
11	2	Back corner blocks	Maple	7	2½	1½
12	2	Front corner blocks	"	7	2½	1½

Crop Reports Encouraging

WE learn that the crop situation in Western Canada never looked better than it does to-day. Perfect weather for seeding, followed by the best of growing weather during the spring months, with plenty of rain coming at just the right time all over the three prairie provinces, has created an atmosphere of jubilant satisfaction among the farmers. This together with the increase of over a million acres in the area under crop in wheat, oats and barley, and the resultant prospects of a bumper crop, forms sufficient basis for the feeling of optimism which prevails among all classes of business as regards the fall trade. This feeling is not confined to any one class of business men, but is most pronounced among those who have the greatest facilities for getting into close touch with the agricultural situation. The building situation in Winnipeg continues to improve, the total building permits for the past six months being within measurable distance of the record year, 1912, and surpassing the total for the similar period of 1913 by over half a million dollars. The totals for the six months ending June 30 last show a valuation of $10,082,400. The first six months of 1913 totalled $9,558,850. In 1912, the biggest year on record for Winnipeg building, June 30 showed a total for the first six months of $11,487,150. For the month of June last, the total value of permits issued was $1,560.200, as against $1,875,800 in 1913. In the building trades, and in contracting generally, there is an ample supply of labor.

There is nothing so cheering as the thought of a good day's work well done.

A Possible Field for Hardwoods

FROM a series of consular reports dealing with the foreign lumber trade it would appear that there is an excellent opportunity for the hardwood flooring people to get into the export business and build up a lucrative trade in hardwood flooring in London, and perhaps through that centre, in other parts of the United Kingdom and Europe. Reporting on the trade in the United Kingdom, the Consul-General of London says that the present-day use of hardwood flooring in London is insignificant when compared with the use of soft woods. Hardwood, he says, is used to some extent in the hotels and skating rinks, and in large private houses where a good deal of entertaining is done. In such cases, the flooring usually takes the form of parquetry rather than that of the usual hardwood flooring so widely used in America. He is of opinion that hardwood flooring will be more generally used in London in the future, and it is this idea that suggests the opportunity to develop trade in hardwood.

To European countries belongs the reputation of having used hardwoods for flooring and other interior trim long before they were taken up in America, and to-day we have instances of wealthy people with the antique hobby of bringing to America at great expense hardwood trim from old houses across the water. There are many people who have the general impression that the use of hardwood flooring is more common in the older countries than it is here, and certainly some of the hardwood flooring ideas did originate over there. Even the term "parquetry" comes from the French. France originated this class of flooring, while hardwood flooring in various forms was used in England long before it was used here. Still, if our consular reports are to be depended upon, it is not now used as largely there as in the United States. From this the deduction is drawn that there is a splendid opportunity for American hardwood men to advance the interests of the hardwood market on the other side of the Atlantic.

To take the place of glue and wood-dowel joints in furniture construction and to give greater strength and rigidity is the purpose of a furniture-locking screw that has recently been patented. It is simply a bolt and nut made in such shape as to be imbedded in the wood about the joint entirely out of sight. A small plate, working like a ratchet in four channels in the screw, locks the bolt automatically at each quarter turn as it is driven into place.

Oak is oak, but woodworkers should ever keep in mind the fact that quartered oak and plain oak should never be dried in the same kiln, because it requires more time for the quartered stock to thoroughly dry.

A prominent German builder of sawmill and general woodworking machinery fits his heavy band log mills with ball bearings.

There will perhaps be more hardwoods used in the planing mill trade this year than ever before. For one thing, there is an abundance of hardwood lumber available, and for another thing hardwood is entering much more extensively into interior trim and finish.

When a band saw wheel develops a wabble, a refacing of the wheel, right in the machine as it runs, should prove beneficial, if not an entire remedy for the trouble.

Up-to-date Woodworking in a Montreal Piano Factory

(Staff Article)

FROM the numerical standpoint piano factories are not conspicuous amongst the woodworking plants of Montreal, but the city possesses one of the oldest established businesses of the kind in Canada. The products of the Pratte factory at 2502 St. Lawrence Boulevard are not large in quantity. They are not intended for the masses, but for those who desire a high-grade article. A specialty is made of producing a piano for teachers and musicians, and these instruments have been used by some of the world-famous artists.

The business was started in 1875 by Mr. L. E. N. Pratte, a man of artistic temperament and of great business ability. Later on he associated with him his two brothers, Evariste and Antonio. Mr. Antonio Pratte, the actual proprietor of the business, was the mechanical member of the firm. At the termination of his musical studies he spent several years in the foremost Canadian and American piano factories, studying the best methods of construction. He is the inventor of the Pratte Piano. The firm make a feature of pianos in special woods with designs of cases furnished by customers or themselves. From the time the order is received it takes from six to seven months to complete a Pratte piano. Special cases are now being finished in mahogany crotch, Circassian walnut, French walnut, burl, rosewood with inlaid brass and mother-o'-pearl.

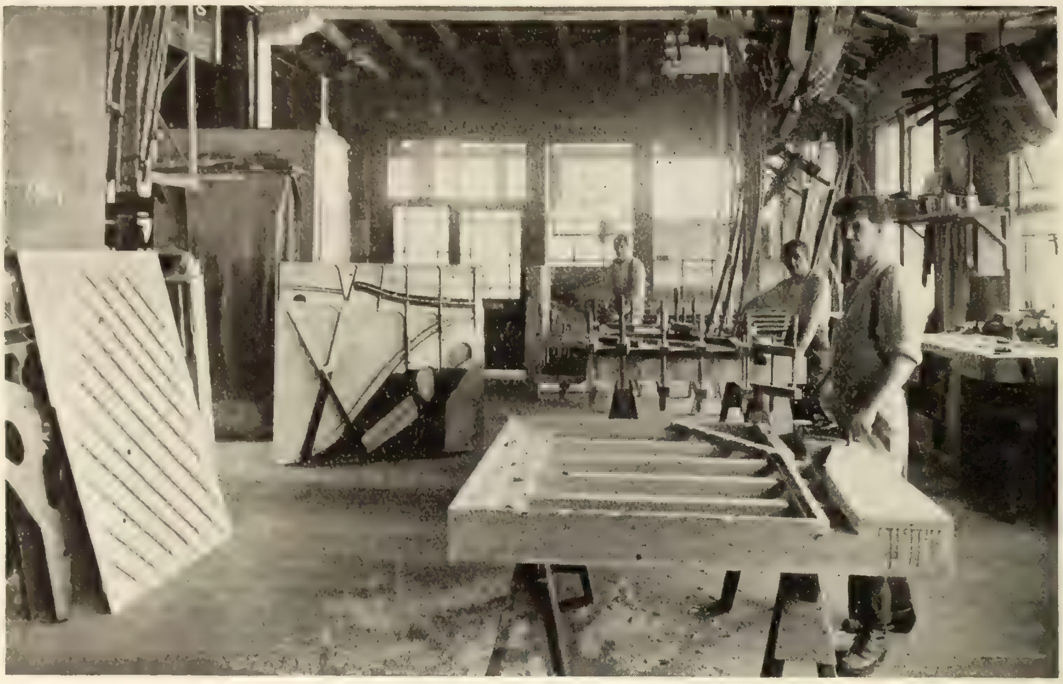
The factory consists of three storeys and is unusually well lighted, having windows on all four sides. The front part of the ground floor contains offices and a number of stock pianos, and at the rear is the case-making and sounding board department. The first floor is devoted to the action department, and the second floor to the varnishing.

The lumber having been properly dried and machined to size, it is covered with a cross-band veneer, the object being to prevent warping. This cross-band veneer in turn is covered with the veneer proper, which contains the beautiful figure shown on the outside of the case. After the wood is properly cross-banded and veneered it is placed in racks, where it remains for a long time, in order that all moisture may be evaporated from the glue used in attaching the veneers. The parts are then smoothed and fitted together.

From the case room the piano is sent to the varnish department, where it remains from three to five months. The aim of this department is to secure the thorough filling up of the grains of the wood and to attain a perfectly even surface. Not only must the filling of the grains be perfect, but the substance with which it is filled must be of the right quality and hardness, so that it will not shrink after exposure to air and heat, and thus destroy the even surface and polish. After several coats of varnish have been applied, the case parts are allowed to stand in a room of uniform medium temperature until the varnish has dried thoroughly and has become a compact whole. The parts are then rubbed down to a perfectly even surface so that when the piano is finally flowed and polished it may show a lustre equal to that of the best cut glass.

The skeleton of the piano is formed by the heavy cross-beams which, in the case of an upright piano, are seen at the back of the instrument. These beams are made of the best quality of hardwood, and to

Varnishing department at the Pratte piano factory, Montreal.



Sounding board department, Pratte piano factory.

these are fastened the sounding board and iron frame. The skeleton having been completed, the sounding board is then fitted and attached to it.

The sounding board, the scientific construction of which is of such vital importance to the quality and volume of tone produced by a piano, is formed of a number of flat strips of the finest spruce, carefully joined and glued into a large sheet. For some days this sheet of wood is shrunk by a dry heat, and while in this shrunken condition, ribs of the best spruce are attached to it in such a manner than when the board cools it has assumed the proper convex form which later will withstand the down pressure of the strings, and will insure harmonious vibrations. The bridges are then affixed to the sounding board; in the Pratte pianos these are made of several strips of hard maple, glued and bent into proper form, with hard maple capping, which receives the bridge pins. This form of

Action department, Pratte piano factory.

bridge favors the transmission of vibrations from end to end, the sounding board becoming more sensitive. This system of construction also greatly increases the strength of the bridge to sustain the down pressure of the strings, and prevents the checking or splitting of the bridges.

The sounding board is then fastened at its rim to the skeleton, in such a manner that while there is not the slightest interference with its vibrations, the massive skeleton holds it in a fixed position, never allowing it to vary from the original convex form which has given the board its correct tension, and from which there can be no deviation. The next stage of construction is the attachment of the plate of finest casting to the skeleton over the sounding board by means of bolts and screws. The plate is a heavy casting, which holds the strings in the proper place, and which must have strength to withstand the strain of 39,000 pounds demanded by the string tension. After this the skeleton with the sounding board and iron frame attached to it, is ready to receive the strings. After being attached at the lower end to the iron frame, these strings go over the sounding board bridge, then the upper bridge, and are finally attached to the tuning pins at the upper end. The tuning pins, which serve in varying the tension of the strings in tuning the piano, go through a wrest plank or tuning pin block, fastened to the skeleton. The wrest plank is composed of several layers of hard maple, glued and crossbanded, the grain of adjoining layers running at right angles one to another.

There are 88 notes and 230 strings in an upright Pratte piano, varying in size and length all through the scale, no two notes having the same length of string. The highest note has three fine steel strings two inches in length, with a tension of 145 lbs. each, making 8,270 vibrations a second, while the lowest note is a single heavy steel wire having a wrapping of copper wire over it, 49 inches long, with a tension of 270 lbs., making 54 vibrations a second. The combined tension of the 230 strings is near 39,000.

After the strings are put on and have received the first tuning, the skeleton goes to workmen who glue the sides of the case on it, fitting also the pedal work, key bed and trusses. The piano is now ready for the action finisher to fit in the action, hammers and keys. The action and keys, although hidden from view except the ivory and black keys, are of the most vital importance. It is upon the exact adjustment of the numerous lever and centre points that the power and delicacy of the touch depend. If this be inexact in ever so slight a degree, the musical character of the instrument is lessened and the task of the performer is increased. In this department all those parts of the piano, such as keys, action hammers, dampers, etc., take their proper positions, and the piano begins to give forth sound as a musical instrument. The main points to be obtained in this department are—first, a powerful blow of the hammers upon the strings, second a light and elastic touch, so that a strong and at the same time musical tone may be produced by the lightest touch of the performer. In the action of a Pratte piano from the keys to the hammers there are 9,474 pieces, made up as follows: 2,056 pieces of wood, 3,436 of metal, 3,823 of cloth, felt and leather, and 159 of ivory; and over 6,500 holes for screws, bushings and pins have to be bored.

The next stage is the fly finishing department. Here are placed in their proper positions all those parts of the piano case which for convenience are separately worked up to a high state of finish in the varnish room. Having been fly finished, the piano goes into the hands of the action regulator, who goes over the fine details and intricate action parts. All interior mechanisms are examined with most scrupulous care, and the slightest variation is detected and adjusted. The piano is then sent to the polishing department to be polished, after which nothing remains to be done but the final tuning and the tone regulating, which is performed by Mr. Pratte himself.

Dates and Periods of English Furniture

FOR those who desire to understand clearly the furniture designs associated with the various periods the following table of dates corresponding with each period will be of interest.

Elizabeth, 1558 to 1603, "Elizabethan"; James I., 1603 to 1625, "Jacobean"; Charles, 1625 to 1649, "Jacobean"; Commonwealth, 1649 to 1660, "Jacobean"; Charles II., 1160 to 1685, "Jacobean"; James II., 1685 to 1688, "Jacobean"; William and Mary, 1689 to 1702, "Queen Anne"; Anne, 1702 to 1714, "Queen Anne"; George I., 1714 to 1727, "Queen Anne"; George II., 1727 to 1760, Chippendale's work about 1754; George III., 1760 to 1820, Heppelwhite's work about 1789. Adam Bros. work about 1790. Sheraton's work about 1791; George IV., 1820 to 1830, William IV., 1830 to 1837, Victoria, Colonial in America strongly influenced by English—especially Queen Anne.

Production of White or Light Colored Pores in Oaks

Present style of many so-called Mission finishes calls for a light colored filler, especially in oaks; the wood having been first sponged, sanded and the pores opened with a picking brush. Effects produced by giving the fillers various shades ranging from absolute white through all the grays, greens and browns, are in many cases very pleasing to the eye. Gray oaks lend themselves well for this treatment.

These finishes are known under many names, but usually finished in wax. Best procedure is to use a strong water stain to give you the color deep enough so that when lighter filler is used, there will be some difference between the stained wood and the color of filler. Effect is to be striking and a good clean job will not permit the filler to be smeared over the wood.

Where an absolute white filler is desired, and where wax is to be the finish, it is well to give the work a very thin coat of shellac, and then mix carbonate of zinc (known to the trade as zinc white) with wax and rub it across the pores until they are thoroughly filled. Let this work stand for 24 hours, then apply second coat of wax and polish.

Where a gray filler is desired, continues a writer in "Brush and Pail," this same procedure can be followed merely coloring the white with dried dropblack.

In a suit for injury to a minor while working at a double-end tenoner, the jury at Michigan Supreme Court found that he was engaged in a "hazardous employment," within the meaning of a law prohibiting the employing of boys under eighteen years old in such employment, where it appeared that he was required to stand in a space about three feet wide between revolving belts.

The Davenport—An Interesting Problem in Cabinet-Making

By R. F. Windoes

THE davenport in the really up-to-date home has come to be considered a necessity. No other article of furniture adds more to the attractiveness of the living room than this massive, comfortable, lounging piece with its soft cushions and pillows to rest the back against. And in the modern office it is also used to advantage. Young builders who have time on their hands to construct such pieces will surely find it an ideal project for their talents, as a market can easily be found for it if their own homes do not demand it.

Of course the ideal wood for such a piece is quarter-sawed oak—red or white as the builder prefers. The mill-man will gladly sand it to exact dimension if it is so ordered, and much time from scraping and sanding will be saved if he does so. The following bill will include every piece necessary for the construction excepting the cushions—which will be discussed later. The dimensions are exact size and nothing is allowed for waste:

Four pieces 3 x 3 x 35-inch legs.
One piece 1⅛ x 5 x 76½-inch top back stringer.
Two pieces 1⅛ x 6 x 76½-in. bottom, front and back stringers.
Two pieces 1⅛ x 5 x 33-inch top end stringers.
Two pieces 1⅛ x 6 x 33-in. bottom end stringers.
Nine pieces ¾ x 5 x 19-inch back slats.
Six pieces ¾ x 5 x 20-inch end slats.

Begin the construction of the piece by shaping the legs. Select the poorest faces as working faces, as they will go on the inside and will show the least. Check them, and lay the mortises out from them. Be very sure to lay out every mortise with marking gauge and scribe the lines across the grain with the knife and try-square. Compare the posts side by side to see that they are properly laid out before doing any cutting at all. Notice that the tenons on the end stringers run entirely through the legs, so the mortises must be laid out on both sides and the cutting done from both faces, working toward the center. (See the detail on the drawing). To make the cutting of the mortises a smaller job, it is well to bore holes through them before doing any chiseling. When the holes are all cut perfectly straight and square finish the ends of the legs with a chamfer—keeping the edges sharp.

Next cut the tenons on the end stringers. As in the case with mortises, lay them out entirely and compare them side by side to see that the work has been accurately done. Be sure to work from a checked working face and a checked working edge when laying these joints out—all lines with the grain with the marking gauge, and all lines across the grain with the knife and try-square. The distance on each stringer between the knife lines must be exactly the same. In cutting the tenons, saw about one-sixteenth away from the knife lines, and finish to them by paring with the chisel. Fit each tenon into its corresponding mortise, and number them. In the same manner cut the tenons on the long stringers, making the tenon just 1¼ inches long so that it butts against the tenon on the end stringer as shown in the detail.

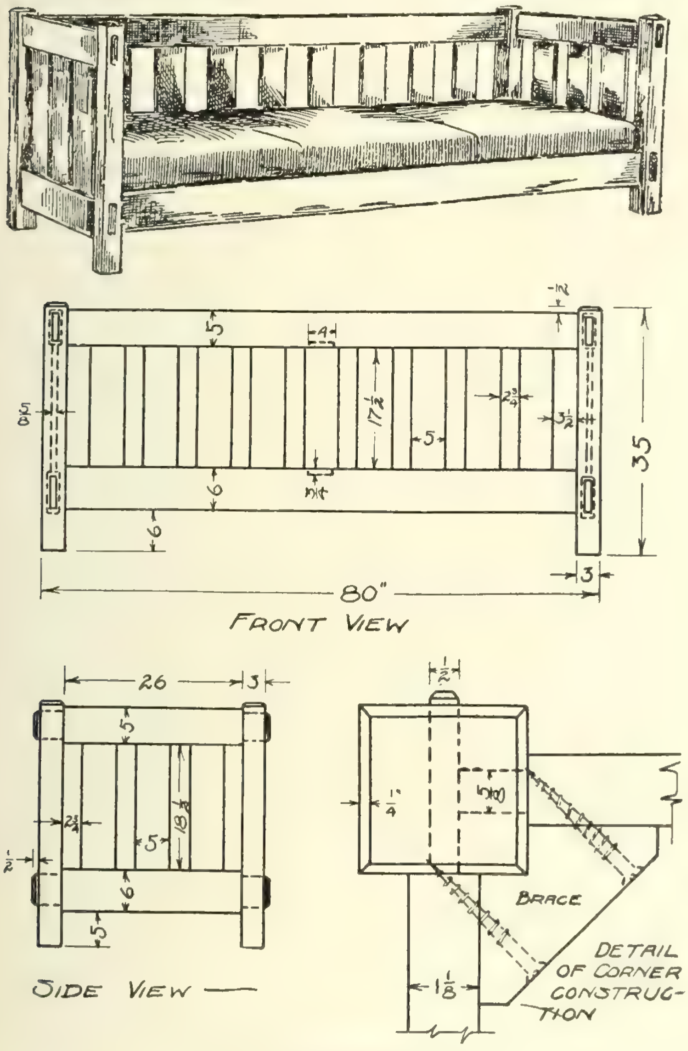
The next step should be the cutting of the mortises for the slats. This work is done exactly as described above—the holes being cut just ¾ inch deep. Fit the tenons on the slats into these mortises, and you are ready to glue. Unless you are an adept with hot glue, you had better use cold glue for these joints as the former would set so quickly that the novice would never make a strong joint. Glue the ends up first by placing the slats between the stringers, and forcing the latter into the mortises. Clamp them securely and allow plenty of time for the glue to set before removing the clamps. After this has been accomplished, glue the long stringers—with the slats in place—between the ends and allow this to dry. Be very sure that the piece is not twisted at this step. It can be easily tested by the use of a steel square, or better yet, with a long pole placed diagonally from corner to corner. If the distance on both diagonals is the same, the piece is square.

A few words of caution at this step may help the amateur to avoid a number of mistakes. Do not fill the mortise with glue and cover the tenon and expect the joint to hold. A thick layer of glue between two pieces is a mighty weak proposition. A tight joint must be made of the wood itself, and a thin layer of glue will then enter the pores of the adjacent pieces and bind them securely together. Another thing concerning glue—do not apply the glue and immediately place the pieces together. Cold glue works much better if allowed to stand in the air until it becomes "tacky," a matter, generally, of ten or fifteen minutes.

A brace in each corner, well screwed and glued, must be placed on the lower part of the bottom stringers as it will greatly assist the tenons in holding the long stringers in place. The next step is the "cleaning up" of the piece. If the wood has been greatly marred during the construction, scrape out all bad spots, and carefully sand-paper the entire piece. All glue that is visible must be scraped off as it will not take a stain, and will look badly if left. Dust the piece thoroughly before applying the stain.

An oil stain, ready mixed, is recommended. Apply it with a soft brush and allow to dry. Over this apply a thin coat of shellac, and sand it off thoroughly. This coat will hold the stain, and allow the builder to sand off the high parts, making the "flake" in the oak stand out prominently. Dust this good and put on a coat of paste wood filler of a shade to match the stain. The filler should be thinned with turpentine or benzine to about the consistency of thick cream, and well rubbed into the grain. Two coats of shellac over the filler, well rubbed down, will put the wood in condition to receive the wax. Prepared wax comes in cans, and the makers recommend two or three coats, to be rubbed immediately after application. A great saving will be effected if but one coat is applied, the piece left to stand over night, and then rubbed. There is nothing to commend in putting a coat on and immediately rubbing it off, and applying two or three more and doing the same thing in order to build up a body. The first coat, when dried and rubbed, will be sufficient. The body of the davenport is now finished.

Unless the builder has had experience in the making of cushions, he had better have them made by an experienced upholsterer. Box cushions, stuffed with hair and covered on both sides, are recommended, as they can be reversed and turned over when worn in one place. A good cushion of this sort will cost more, though, than a spring cushion covered on one side only. The upholsterer will make the frames for the cushions if the latter are used, so no detailed description of them will need to be given here. Concerning the prices charged for such work, a spring cushion covered on one side only with genuine Spanish leather will cost about $22, while a hair cushion covered on both sides with genuine Spanish leather will cost about $30.00. These prices will vary somewhat with the locality and the grade of workmanship and materials used.



Constructional details of davenport.

The preventive for checks in three and five-ply veneer work is to have the veneer thoroughly dry before laying, and get the pressure on before it can expand as a result of contact with moisture from the glue. If these conditions are complied with, and the veneer is laid with the grain across the grain of the core stock, then one had better look to the quality of the veneer he is using, if he finds checks.—Walter Clement in Veneers.

The saving is so great when a planing mill man can do two or more jobs of work of the same kind at the same time, as compared to doing each separately, that every mill man should make an effort to group his orders. Keep a careful time and cost account of these things awhile and it will be easy to see and appreciate this point.

The Problem of the Old Employee

Contributed by Leo Forrester

WHAT is to be done with the old employee; the man who has been years on the pay-roll, and who has grown old and gray in the employ of the company? When he has outgrown his usefulness, and it is no longer profitable for the firm to employ him, should he be "fired," retained, pensioned, or what? Few firms are financially able to pension the old employee, yet neither desire to retain him or discharge him. What action to take becomes a problem.

It is difficult to determine when an old employee has really outgrown his usefulness. After thorough investigation of the subject, I have come to the conclusion that it is a condition depending largely on the employee himself.

There are many different types of old employee: the man who is physically capable but who takes advantage of the fact that he has been long on the payroll and "soldiers"; the man who does what he can to the best of his physical ability; the man who becomes mentally and physically incapable of any but the most simple work. It would be a fine thing if every worthy old employee could be pensioned. But most firms find this impossible. The question arises, how is the worthy to be distinguished from the unworthy? Is the employee to be retired on a pension after a certain number of years of service, or only when he becomes incapable and inefficient? And when does he become incapable and inefficient?

Age, oftentimes, has little to do with it. Some men at sixty are more capable than other men at thirty. The old saying that God helps those who help themselves is perfectly true in this instance. The old employee must help himself to the best of his ability, if he expects to be helped, and should not use the fact that he is an old employee as a fulcrum to gain personal vantage.

Times change and methods of doing things change. Things are not done to-day as they were twenty years ago. This is an age of efficiency. In every line of endeavor the human brain is alert to conceive more efficient methods of doing things. The workman who is efficient is the man who is in demand. The machines of to-day, comparing quality and quantity of production, are mechanical marvels beside the ones of twenty years ago. How many of the old employees that you know, men who are physically capable, though past the fifty or sixty-year mark, are really trying to help themselves by learning new and more efficient methods on their work?

It has been my experience that the average old employee is a delicate proposition to handle, that he isn't willing to learn new methods. Though physically capable, if asked to do his work along scientific and more efficient lines he rebels. He considers that he is being driven—an injustice after the years of service he has given—and stubbornly insists on doing his work in the way he "learned" it. Younger workmen all about him are producing many times the amount of work he is producing, not because of any particular physical or mental inability on his part, but because he resents being taught new "tricks." He could easily do more if he wanted to, but won't. And when it is reported to the office that "old man" Williams is a back number, and has outgrown his usefulness—which he hasn't—he becomes a problem, mainly through his own fault.

The old employee should learn to help himself, should learn new methods of doing things, and become an asset to the firm who employs him instead of a debit. A matcher, moulder or band saw of today is not the machine of years ago, and must be operated accordingly. The old workman who learned the business on matchers having maximum production of 30 feet, should study the new methods that enable operators of present-day matchers to obtain even better results at 200 feet. Efficiency is the watchword of to-day. The old employee, instead of being rebellious, should learn the more efficient way of doing things. If he refuses, he becomes a problem, and must be either retained on his job because the "boss" hasn't the heart to discharge him, or he may be changed to different work or retired on a pension.

Facts of Interest Relating to Hardwood

By A. Ashmun Kelly

WITH no figures at hand to base an estimate upon, any such estimate as to the number of wood-finishers who know intimately the woods they treat would be the merest guess, hence I make the guess that the percentage of such workmen is about 75, and this is probably too low a figure. However, let me come to the point I am driving at, namely, that it is important that the wood-finisher should know all about the wood he deals with, even to the trees that yield the wood for his uses. Let us take mahogany to start with. This wood is not in common use, like oak, for instance, yet when one has it to deal with in the finishing thereof, one needs to know all about its characteristics, if one would do good work with it. It is stated by an authority that at least fifty different, though in many respects similar, woods are sold under the name of mahogany. There is only one true mahogany, the species Swietenia Mahogani, order of Meliaceae.

When you speak of white mahogany you refer to quite another tree, the butternut. True mahogany wood is of a rich red-brown, a lustrous brown, not dull, but full of fire in some instances. Stone, an authority, tells us that Cape mahogany shows much of this fire or phosphorescent luster. Dr. Gifford says that birdseye mahogany is not uncommon. As to mahogany wood in general use, it may be said that much of it is undoubtedly Spanish cedar.

Mahogany wood is cold to the touch, heavy, and very cross-grained; it is durable, seldom warps, cracks or shrinks under ordinary conditions, provided it has been well seasoned. Kept under water, it will last indefinitely, and stands all sorts of climates well. It is mainly heartwood, having but little sapwood; as a cabinet wood it is one of the most difficult to work.

One of the most beautiful forms of mahogany is that of the Juglans Regia, a tree found growing on the southern slopes of the Caucasus mountains. The more defective this wood is as to its habit or growth, the more interesting and handsome its wood, while its color leaves nothing to be desired in that direction; its veins or figures are found in great variety, with light and dark shades accentuating the whole; its finished surface is of a delicate ivory color. The wood is used almost entirely for veneers, and as the wood is scarce, particularly the choice burl parts, the veneers are sawed exceedingly thin, hence there is a common prejudice against the wood, on account of its unsatisfactory appearance, a fault not belonging to the wood, of course, but to the workman who shaves it so thin. It is especially liked for picture framing.

Baywood is the name given to a wood which much resembles mahogany in appearance, and it often passes for mahogany, but it is a poor substitute for the real thing, being soft and light of density, and it does not possess the fine figures seen in true mahogany; it has considerable of the real mahogany color, so that when properly stained it makes a passable imitation, and it may be worked in with true mahogany where the contract demands a little cheapening somewhere. Its

Let us now consider briefly that other handsome wood, maple. There are two principal varieties of this wood used in finishing, plain and birdseye or curly. The birdseye maple is beautiful when sawed straight with the growth, but the greatest variety of figuring occurs when the wood is sawed transversely or otherwise, and chair backs, cut out in circular sweeps, sometimes show both the birdseye and curly or mottled effects, at different parts. The occurrence of eyes, mottles, zones, spots and small curls in this wood show figures of exceeding beauty, making this one of the most desired woods for cabinet or furniture-making. The birdseye maple shows in the finished work the peculiar appearance of small dots or ridges, or of little conical projections, with a small hollow in the centre, but without any resemblance to knots, the apparent cause of ornament in other woods of similar character, as the burrs of the yew tree and Russian maple or birch tree. It was once thought that these so-called eyes were the result of birds pecking at the bark of the tree, but Holtzappfel found, upon careful observation, that they were caused by little spines or points in the bark, the layers of wood being molded upon these points, and each of their fibres is abruptly curved at the respective places, and, when cut through, they give, in the tangential slice, the appearance of projections, the same as some rose-engine designs.

The Oregon maple is light-yellow in color, and its surface is figured with small, wavy lines that show up very fine, particularly in the presence of artificial light. It gives a very handsome finish. Of the maple wood it may be said that it is one of great antiquity as a cabinet wood; it was well known to the ancient Romans, who made furniture from it, they considering it one of the most desirable woods for that purpose. Pliny tells us that maple could only be obtained in small pieces and that it was employed in the making of writing desks and so on. For centuries maple has also been used in constructing parts of the violin.

Of American or black walnut little need be said. It grows easily, in soil that favors it, such as lowlands, for it loves water, or at least "wet feet," and in this respect is the opposite of the chestnut, which delights only in dry, stony soil. Buyers travel the country over, seeking out walnut trees of suitable size, paying handsome prices for them, and in this way even isolated specimens are not spared. Forty years or so ago walnut was extensively used in making furniture, and so great was the vogue for that kind of finish then that it became the general impression that most of our walnut timber disappeared—whole forests of it in Indiana, Pennsylvania, etc., though large quantities of this wood are still available. The latter produced the most desirable walnut, owing to the fact that most of the trees grew out in the open, while that of Indiana grew in forests, hence the trees were tall and straight-grained. The black walnut is at home in the eastern half of the United States, and, as previously stated, delights in a rather moist soil, and one that is rich, too. It is wood easily worked, owing to its straight grain, even the best veined being straight. Oiling this wood causes it to become quite dark, almost black, indeed, with time, though there are some very light spots; these should be darkened to match the darker portions. French walnut comes to us in the burl variety and makes beautiful veneers.

Birch is another fine wood, but owing to a want of uniformity in color and markings it is rather difficult to work. If it is stained it is very liable to fade out. Yet we must place to its credit the highest physics, as the experts term it—that is, the highest quality—of any American hardwood growing in reasonably large quantity, excepting that of the best types of oak. Its strength and density is far superior to that of gum; it will hold its finish better, and, when other than aniline stains are used on it, will hold its color as well as any wood. Briefly, birch has density, weight, strength, good working qualities, and comparatively low cost. Birchwood contains a very small amount of oil, which, if not eliminated in the drying process, will cause defective glue joints. The finisher will stain the wood lighter or darker, according to the way the wood runs, any sap present requiring stain to make it match the rest. Excepting in the high grades of furniture, the cabinet or furniture-maker does not try to match the wood's figures very closely, and in gluing he places sap edges together and heart edges together, in order to insure a durable glue joint. Then the finisher comes in with his skill and stains certain parts to make the whole surface or article uniform of color. This wood requires a paste filler, which is sometimes, though not always, stained.

Birch comes straight and curly, and there is both white and red birch. Any variety, however, is usually stained. The grain of this wood is close and fine, and as a rule its grain runs straight; it is a dense wood, hard and heavy, but never tough or coarse-grained. It is easily cleaned up and made ready for the finishing. Curly birch looks well when finished in rich chocolate-brown, but mahogany color should not be used on it. For white birch natural finish—that it to say, no stain—seems best suited to show up its beauty. The best varnish finish for this wood is one that is rubbed dull, as it does not look so well with a lustrous finish. This will apply to any variety of birch.—Veneers.

The furniture manufacturing fraternity has taken so well with the idea of high-grade, artistic furniture that the point has been reached where either the public will have to be persuaded to buy more of the high-priced offerings or else there will have to be a turning back to less expensive products. It looks like a good time for some of the trade to give more attention to pleasing patterns in less expensive furniture.

An office furniture manufacturing company selling direct to the consumer follows an interesting and effective method of visualizing its product as applied to the particular needs of a prospective customer by offering to "set up," on its sales floor, a complete outfit of the kind needed for the purposes of the prospect. The company has a larger show room space than is possible with many retail stores selling office furniture, and it also has a larger stock than is generally carried in any such stores. These factors make the plan more effective, perhaps, than would usually be possible for a retail store, though the idea is without doubt capable of full or partial adaptation to many an office furniture business, for it must be conceded that few men can see chairs in the basement, filing cases on the first floor, and desks in the storeroom, and at the same time gain much of an idea of the appearance the whole combination would make.

Furniture Man in the Limelight

It is of interest to note that Mr. J. R. Shaw, Managing Director of the Canada Furniture Manufacturers, Limited, Woodstock, Ont., has been elected Chairman of the Legislative Committee of the Canadian Manufacturers' Association. Mr. Shaw became identified with the furniture manufacturing industries some twenty years ago. He was then Solicitor for the Furniture Association, and in the years that followed, through constant contact with manufacturers in this line of business, and the problems they had to solve, he received the idea that an amalgamation of the many Ontario industries engaged in furniture making would work for the betterment of all concerned—manufacturer, workman, and retailer alike. In 1899 he was successful in interesting capitalists in the proposal to acquire by purchase, furniture factories in Wiarton, Berlin, Walkerton, Seaforth, Waterloo, Wingham and other Ontario towns, and later on Woodstock was added to the list by the acquisition of what was then and still is the largest furniture manufacturing plant in the Dominion, founded in 1843 by James Hay. The company which in 1899 came into existence was the Canada Furniture Manufacturers, Limited, and by steadily pursuing the original policy of specializing at its various plants, the product of this company enjoys to-day a reputation

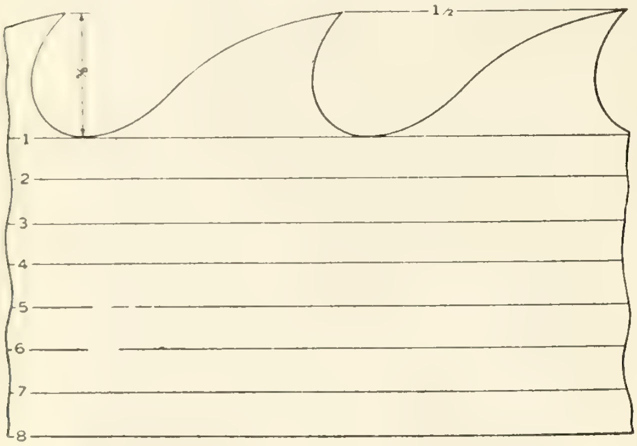
Mr. J. R. Shaw

that any manufacturer might well envy. Mr. Shaw, or "J. R.," as he is most generally known among his intimates, has held the position of Managing-Director ever since the company began its operations, and for many years has also been its Vice-President. He enjoys the confidence not only of his associates connected with the company, but to a remarkable degree of his fellow manufacturers in the business.

Band, Scroll, Circular and Metal Saws

By Ted Keefer

IN this article I will give a few suggestions which, by actual trial and experiment, have proved successful in the art of saw-fitting, to eliminate cracks, and to keep the saws in shape with least time and labor. The first thing to do with a new saw is to put it on the bench and make a chalk mark to work to and from. Then roll it clear around on the extreme edges; make the roller come over the edges to make pressure come on extreme edges, both front and back, as at 1 and 8, in section of band saw. This loosens the edges and will relieve the great strain thereon. Care must be taken to not roll too heavily, or the edges will be too loose and the saw will snake in the cut. Very little is required—just enough to ease the strain on extreme edges. Next roll about ¾ or 1-in. from the front edge at 2, with nearly as much pressure as you had on extreme edges. Then roll about ¾ or 1-in. from the back edge, at 7, with same pressure as you used to roll 2.



Care must be taken not to roll too heavily.

The spaces between the edges are called the tires, and at these places the saw is "fast." That is, there is a fast place extending clear around the saw just back of the edges, and instead of the strain coming on extreme edges, it comes just back of them, and the saw will not crack. Sometimes it is advisable to carry a little wider tire, owing to certain conditions of the mill wheels. I once had to carry 1¾-in. tire in front before the saws would work.

To tension the blades roll about 1-in. from 2 and 1-in. from 7 clear around the saw (except for long cracks), and about 1-in. therefrom to center, at 4 and 5. By picking the saw up from the bench and shaking it you can tell when it has about enough tension. It should be quite limber now; if not, roll a little more between 2 and 7, for a little more tension. Do not roll too hard or you will get too much tension and it will take some time to take it out to make it correspond with the tires and edges. The saw should not bow up on the bench, but lie perfectly flat; if it does bow up, there is too much tension. To reduce this it must be rolled toward the edges, lengthwise, to make it lie flat again.

Before going any farther in connection with the tension it is necessary to level the blade off and draw out the back 1/32-in. in 5-ft., which is usually enough back. The way I draw out the back is to ascertain the places which need it, mark them, then roll down the center, next about 10-in. from there, then to the tire, and last on the back edge, but not quite so far on the extreme edges, 1 and 8. If the front needs drawing out to straighten, proceed on the front side from center as you did to draw out the back. When drawing out the back and front be careful to not roll too heavily, keeping the blade level, which will reduce your time and save considerable labor in the whole process. To even up the tension some use a tension gauge with 46 circle, but I don't think that is deep enough. I am using a 32 for a 6-ft. resaw mill, but wouldn't advise its use until more familiar with this method. Use about a 36 or 38, which will give good results.

Never roll on the tires except when you cannot draw out the back or straighten the front in the way here explained; then a light roll on the tire will let the back go out, or the front, as the case may be. After rolling on the tire always roll on the edge and extreme edge nearest (at the same time), as that will restore the tire which has been let out by rolling. In rolling for tension the blade may be rolled any place it needs it except on the tires.

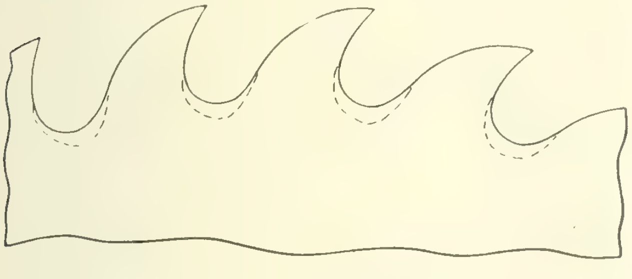
Hold the tension gauge straight up, and by holding the blade up with the other hand under it there should be light showing under the gauge clear across, gradually getting darker till it gets near the edges, where it should show dark on the tires. To test the tires hold tension gauge out until the center is over the tire and it will show as though there was a lump there and you were trying it with a straightedge. This is the condition you want the edges in.

Another way of testing for tire is to take a straightedge about 2-in. long, raise the saw up as in testing tension, hold the straightedge over the tire, and it will show fast, or as though there was a lump. Then put your hand under the saw, hold the straightedge over your hand, and it will show open or light. Another test is to take a straightedge 12-in. long, place it on the inside of saw at center of the bend as it hangs on the bench for grinding, and you will see light clear across except on the edges, where it will show dark. But if you look closer you will see, just under the extreme edges, there is a little lump. This is the part of the saw that receives the strain, and in this condition it will not crack and will stand a good feed.

When there is a crack the saw should be fitted just the same as if the bottom of crack was the edge of saw. Always drill a hole at the bottom of a crack, which is the same principle as a round gullet, which should always be kept in a saw. In punching a crack use oil, and punch slowly on both sides by hitting light blows and punch clear through. If it is a long crack the tension should not be so deep. The best way to do with a long crack is to take the saw apart in the filing room, and, if necessary, put a piece in, instead of having the danger of saw flying off the mill. Dodging is sometimes caused by the mill not being in perfect line; and often it will be found that a saw in first-class condition does not run well or saw properly.

Every filer should examine the mill when he takes a new position. First to see that the bottom bearings are level and there is no play in them. Line the two wheels with each other and see that their faces are perfectly flat clear across and that the wheels cut a true circle. If not, grind them so the mill is true and flat, as they are often as much to blame for unsatisfactory work as poorly-fitted saws.

In swaging the teeth before grinding use a little lard oil on face of teeth. Keep your swaging anvil and block in shape so it gives a neat, even spread of swage on both sides of teeth, and so all teeth are swaged nearly the same. Then see that the shaper shapes evenly and about 5 gauges wider than the blade. In grinding, set the grinder so it takes off just enough in front to square the tooth face and just enough to flatten the back. Always keep the gullets round and keep the file off the saw. It is a very good idea to go over the teeth with a set gauge after you have swaged and shaped them, as often I have found several teeth bent, some one way and some another. Keep the teeth straight, do not grind too hard, and a saw will stand several grindings without swaging.



Punch bump from dotted lines out.

When the saw is placed on the mill and the strain put on, is the time to adjust the guides and do it properly. Every time you change saws see that the guide-blocks on one side just clear the saw in front and are just a little more open in the back. Then close the bottom guide and see that the other side of guide-block just clears. Do the same with upper guide, but take special notice to see that it is in line with bottom guide, whether it is up or down. A good stiff wire brush or brass scraper should rest on the bottom wheel of mill to keep it free from gum, pitch and dirt. Sometimes it is necessary to pipe the lower wheel with a water supply pipe to keep it moist and clean.

The gullet is the place where circular saws crack, therefore the loosening should be confined to the extreme edge of gullet, which may be bumped with a bumping punch only in that portion which is most likely to crack. Some may laugh and say it will be too loose on the rim. But do not release too much of the strain—a very little on extreme edges—and don't touch the teeth.

Small band or scroll saws sometimes need hammering, especially where very much hardwood is sawed. They only need enough to keep them from having too much back, therefore must be hammered close to the tooth edge. If properly done, this has some effect on the saws that keeps them from crystalizing so soon. The guides and bearings must be well looked after, also the tires kept as nearly flat as possible. If they wear ridges in them, don't tear them off, but take a piece of coarse sandpaper, put it on a stick, and fasten this stick in machine some place where is can be raised against the wheel and will not be jerked away. With this cut the rubber tire slowly down to a flat surface again.

Band saws for sawing sheet metal, strap iron, thin brass, etc., are different from scroll saws in that they have fine teeth—about ten or twelve to the inch. The temper is the same as the ordinary scroll saw and they may be filed. Give them only enough set to clear and do not give them any hook. A little less than no hook is best for very thin sheet iron, as 20 or 22-gauge. Bottom guide should be as close to table as it can possibly be. If the guide holds saw straight just under the table you can saw a straight line very fast; in fact, 20-gauge metal can be sawed as fast or faster than 1-in. pine on a scroll saw.—The Wood-Worker.

Some "Safety First" Hints

The Burroughs Adding Machine Company, Detroit, Mich., in a magazine issued to the employes, gives the following safety hints which are commended to woodworkers.

Avoid wearing loose fitting clothing and jewelry or gloves on the hand, especially around machine tools.

Adjustments and oiling should be avoided when a machine is running.

When operating a machine give the work your undivided attention. It may save spoiling a job, if not more serious damage.

It is extremely dangerous to set cutting tools in a moving machine.

Do not lounge on a moving machine, and keep a respectable distance from all moving parts, especially gears and cutters.

Form the habit of never standing in line with swiftly revolving parts, such as emery wheels, pulleys, etc.

An orderly exit of employees at noon and end of the day is important, especially when it is necessary to descend staircases.

The wearing of long coats by workmen is to be discouraged. Aprons, not ragged, fastened with strings that will not break easily under strain are better.

When handling a belt between two overhead pulleys, never place the ladder between the shafts nor rest it against a revolving shaft.

Do not be ashamed to shift belts with a stick instead of the hand, and for overhead work, always use a stick reaching nearly to the floor.

Do not wipe chips from revolving cutters with the fingers on a steel scale. Use a brush on the off side, and with care.

Never reach across the revolving oiler to regulate the oil feed.

Hang up oil soaked clothing so that air will get to it.

Hickory is the strongest Canadian wood. When properly seasoned a hickory column will support a weight of twelve tons per square inch cross-section, which is considerably more than what could be [illegible] by a pillar of cast iron or steel of the same length and weight.

The Modern Methods of a Montreal Plant

An Outline of Up-to-date Practice and Systematic Business Principles which have Brought Results for Wm. Rutherford & Sons Company, Limited, and The Dominion Box & Package Company, Limited

THE woodworking plants of the William Rutherford & Sons Company, Limited, and the Dominion Box & Package Company, Limited, Montreal, are the centre of operations which are of particular interest to readers of the Canadian Woodworker.

The business of the William Rutherford & Sons Company was started in 1856 by the late William Rutherford, father of the present officers of the company, at the corner of Dorchester and Drummond streets, and was afterwards removed to Point St. Charles, and from there to Chatham street. Finally, it was moved to its present location on Atwater avenue, occupying two blocks bounded by Notre Dame street, Atwater avenue and Levis street, and extending back to the Lachine Canal banks.

Plant of the Dominion Box & Package Company, Montreal.

The company are the owners of the largest combined business of wholesale and retail lumber, planing and saw mill, and interior finish in Eastern Canada. It may fairly be claimed that the name of Rutherford is synonymous with "lumber and millwork," and the work of the firm can be seen in most of the principal office buildings, schools, churches, theatres, and apartment houses in Montreal.

Of late years, to keep pace with the rapid growth of Montreal, special attention has been paid to builders' supplies and stock millwork for immediate delivery. The extent of the trade may be gauged by the fact that the company carry in stock about 20,000 hardwood and softwood doors, in addition to heavy stocks of window frames, sash, cupboards, cabinets, stairwork, posts, columns, mouldings, beaver board, roofing, tar and sheathing papers, etc.—in fact, every requisite for this line of commerce.

The yards, planing mill and the general interior finish factory cover a very large area. The main building is 3 storeys high and well lighted in every portion. Two elevators render the handling of material a mere detail. The plant is laid out for the economical manufacture of all kinds of wood products. The total force employed is some 500 men, of which 100 are joiners. The factory is equipped with a sprinkler system throughout.

The kiln for drying the lumber is located near to the lumber piles and a little distance from the main factory. It is in two sections:—In the first, free steam is circulated through the lumber to extract any acid which otherwise would stay in the lumber, if it were only subjected to dry heat. After remaining in the free steam kiln for some hours, the trucks are run out on rails (which traverse the entire double section) into the section, where ordinary dry heat is circulated.

From the kiln the lumber is distributed to the moulding and planing mill or sash and door department. That which is not required is sent to a storage shed where it is culled, sorted and racked. The mill is equipped with all the most modern woodworking machinery, such as band saws, matchers, surface planers, dimension planers, rip saws, and boring machines. Air lifts facilitate the easy handling of dimension timbers which have to be machined, and also enable the timbers to be loaded on to rigs for delivery or put through to other departments for further operations.

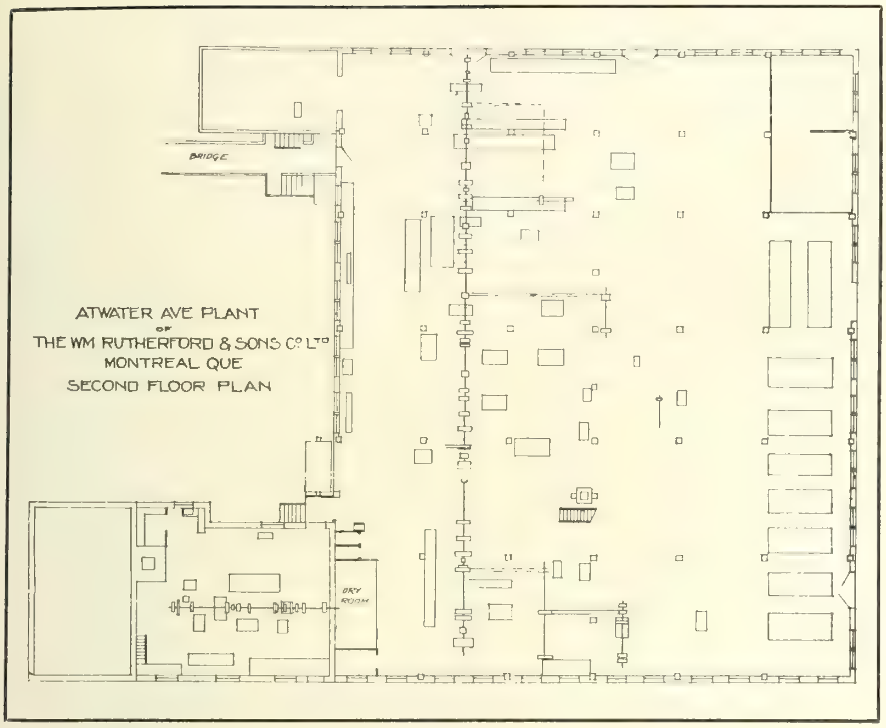
Lay Out of Main Building

The ground floor of the main building comprises the planing mill and moulding departments, where numerous high speed machines are kept continually running. The first and second floors are laid out for the economical manufacture of goods and in such a way that handling of the raw and finished product is reduced to a minimum.

On the second floor, is located the glue room and press room, for the manufacture of veneered work. The stair building department is also on this floor, completely equipped with modern machines run by dynamos. Here all parts necessary for the complete manufacture of stairs are made ready to erect on the job.

Adjoining the stair department is the paint and finish shop, where such goods as require it are treated. The factory has two very efficient blower systems, one for shavings and the other for sawdust. Part of the shavings goes to feed the boilers and part is baled by a baling machine and sold to the stock yards and to farmers for bedding for cattle, etc. The sawdust is conveyed to a separate bin, from which it falls down to the ground floor, where it is bagged and sold.

The boiler house contains five boilers, and the engine is 250 h.p., supplied by Laurie Engine Company,



Montreal. There is also a small electric plant for illuminating purposes and for running a portion of the machinery. When repairs are necessary to the boilers, temporary dynamos are installed and the plant is operated as usual. An air compressor supplies the air for the lifts and also for cleaning the factory.

The machinery in this plant was supplied by the following firms:—H. B. Smith & Company, Smithville, N.J.; The Berlin Machine Works, Hamilton, Ont.; S. A. Woods Company, Boston, U.S.A.; Connell & Dengler, Rochester, N.Y.; McGregor, Gourlay Company, Galt, Ont.; E. B. Hayes, Wisconsin; Greenlee Bros., Rockford, Ill.; Robinson & Son, Rochdale, Eng.

The raw products and lumber come in by barge and by Grand Trunk and Canadian Pacific Railway, sidings of these two lines running into the yards, so that the loading and unloading facilities are unexcelled.

The company always have on hand large quantities of hardwood for manufacturing purposes, in addition to the ordinary grades of lumber, of which millions of feet are continually stocked.

The stock millwork and builders' supply business is kept separate from the manufacturing end of the business, and is located in a large two-storey warehouse on the opposite side of the road from the main plant. This warehouse is about 100 ft. x 300 ft., and the ground floor is used for storing prepared hardwood, dressed lumber and mouldings, while the upper floor is stocked with thousands of doors in a variety of designs and woods, cupboards, stairwork, windows, etc., for immediate sale and delivery. Reserve stocks are carried in another huge warehouse, located on the Lachine Canal bank and Levis street. In addition to the horses, three "Albion" motor trucks are used. These trucks have proved both durable and economical and it is probable that they will to a large extent replace horse haulage in the near future.

Two branch yards are operated, one at Outremont, and the other at Mile End, in the north end of the city.

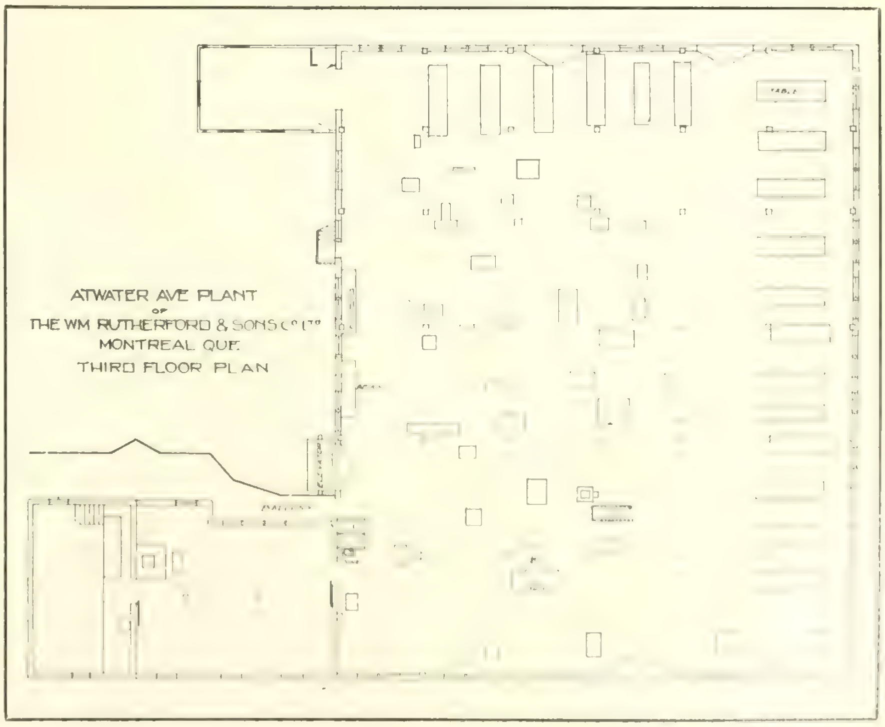
The officers of the company are Mr. Thos. J. Rutherford, president; Mr. Wm. Rutherford, secretary-treasurer; Mr. Andrew Rutherford, vice-pesident; and Mr. Stewart F. Rutherford, director. The wholesale and retail lumber department is under the direct supervision of Mr. Thos. J. Rutherford, with Mr. E. Dickson as assistant, while the interior finish millwork specialties and general factory is under the supervision of Mr. Andrew Rutherford, with Mr. L. W. Halliday, as assistant, and Mr. Wm. Rutherford as secretary-treasurer, looking after the financial department. Mr. Wm. Dube, the superintendent, has been employed by the company for 23 years, from stairbuilder to his present position.

Mr. Thos. J. Rutherford is a native of Montreal, where he was born in 1858. He commenced his business career with his father in 1874, and afterwards became a partner in the company.

Dominion Box & Package Company, Limited

Allied with The Wm. Rutherford & Sons Company, Limited, is the Dominion Box & Package Company, Limited, the operations of which are carried on in a mill occupying about one-third of the former company's premises. It is a separate organization although there is naturally co-operation between the two companies.

Formerly, the Wm. Rutherford & Sons Company,



Limited, had a box factory at St. Henry, but three years ago they amalgamated with the Montreal Wire Bound Box Company, and formed the Dominion Box & Package Company, Limited, and a year later moved to their present location, where a new mill was built and equipped specially for the manufacture of packing cases.

Box companies are, as a rule, run on small margins of profit, and the management which desires to make money has to study ways and means more carefully than in any other form of woodworking, if packages of the best quality are to be produced which will at the same time yield the owners a fair return. In the case of the Dominion Box & Package Company, Limited, this matter of economical production has been carried out minutely, and the company is more than usually well fitted for the manufacture of a first-class article at the least possible cost.

The lumber yards are particularly well situated, it being possible to bring in lumber by canal, or by C. P. R. and G. T. R., place it almost directly into piles, from which it is but a short haul to the mill. Lumber is brought well ahead of the actual requirements, and at the time of the visit of the representative of the Canadian Woodworker there was well over a year's supply of all the grades used in the business, a fact which is a very important factor in making quick and reliable deliveries required in this line of trade.

The mill itself occupies about one-third of the block bounded by Notre Dame, Atwater avenue, and Levis street, and is built three storeys high, every square foot of its floor space being utilized with a view to making the process as continuous as possible so as to prevent congestion and unnecessary handling.

The lumber, as it comes from the yard, is dumped behind the surfacers, of which there are two, which deliver the lumber dressed on two sides directly into the mill, where it is piled at once behind the cutting saws, which are of the swing and live table type, placed lengthwise of the mill. The rip or fitting saws are placed at right angles to and beside the swing saws, so that the operators do not have to move from their tracks in performing their work.

This battery of saws is driven by two 10 h.p. motors suspended from the ceiling, which drive half of the sets through a very unusual and ingenious arrangement of belting and shafting. The drive was split in this way in the first place so that in the event of dull times it would be possible to run but one motor and operate but half the saws, but it is significant of the progressive policy of the company that it has never seen a time when it could afford to stop any of its saws, not to mention one-half of them.

Mr. Thomas J. Rutherford.

THE EXECUTIVE HEADS

On the left, Mr. Thomas J. Rutherford, President of Messrs. William Rutherford & Sons Company, Limited; on the right, Mr. Stewart Rutherford, Managing Director Dominion Box & Package Company, Limited.

Mr. Stewart Rutherford.

The groovers are situated close to the saws, and in the centre of the mill, to avoid handling of the pieces and so as to be readily accessible from any of the saws, while each outside bay of the mill is occupied by a dovetail jointer made by the Canadian Linderman Company, which are used for the finer class of boxes on account of the strength and neatness of the resulting joint as compared with the ordinary tongue and groove. As a matter of fact these machines are kept busy in preference to the regular groovers, on account of the saving possible in lumber and the superiority of the finished box.

Lumber matched together on these machines is as strong or stronger than solid wood itself, and it is a fact that where glue is used it is very seldom that a break can be made in the joint. It is self-evident that boxes made on these machines would be stronger than those made on the ordinary groovers as all slack and slip between the pieces making up the package is absolutely eliminated, and the resulting package is a rigid and safe container which, by actual test, shows itself to be 50 per cent to 75 per cent stronger than any other package on the market. Where it is not possible to make the whole box with this process, either the ends, sides, tops or bottoms are so combined with those made on the ordinary groovers as to produce a package which is amply safe and strong for the weight to be carried.

There are two band re-saws for splitting the shook, one a twin which makes two cuts simultaneously with the same labor outlay as would be required for one cut, and a large single 7-in. machine which is used for the heavy work, such as shoe cases, etc. Cuts up to 33 in. in width are made on this machine every day. The twin is not suited for this heavy work but is an extremely fast machine for light stuff not exceeding 18 in. in width, so that the work is divided between them to the best advantage.

Handling the Finished Product

The stock is next carried by a hoist to the second floor where the first operation is trimming for length and width, a very small allowance having been left so that the box when it is finished may be neat in appearance, and exactly true to size, after which it is usually stocked in a space extending across the mill, behind the assembling machines, or taken further along to the printing room where the printing is done by three rotary two-color presses and two small flat presses. The stock is then ready to be assembled, and goes directly to the assembling machines, which extend lengthwise of the mill, consisting of the most up-to-date machinery for the making of large and small nailed cases, dovetailed and lock corner boxes. All this work is done by machinery, and very little hand work of any kind is done except in special lots too small to be handled to advantage on the machines, or special boxes which require considerable hand work. The latter class of article is taken care of in the centre bay of the mill, where all the machinery necessary for their most economical assembling is located.

The finished cases, after leaving the assembling department are piled on large trucks by the men performing the last operation, and taken directly into the shipping room, where they are sent down slides to the teams in the street below, or sent to the top floor for storage until needed, by an endless chain carrier, which is reversible to bring them down again when required.

Across the whole mill in front of the cutting saws runs a conveyor for waste blocks, which dumps them on to an inclined conveyor which takes them to the third floor and dumps them into a bin on the second floor, so that the carts are loaded from this bin by gravity. All the wood waste from this mill which can possibly be utilized for the purpose is sold as kindling wood, and the company has a very good demand during most of the year for this waste.

The company gets the full time of its sawyers who are expensive men. There is never any waste under foot in any part of the mill, as everything undesirable in the lumber is cut out and disposed of once and for all, and the labor of handling the wood is reduced to a minimum.

The mill is driven throughout by electric motors, a number of machines being grouped together so as to secure the greatest economy in power consumption, and at the same time make it possible to run one set of machines for a special operation overtime without interfering with the rest of the mill.

Fire protection is provided by Estey Automatic Sprinklers all over the mill, in addition to which there are the usual hose outfits, water barrels and chemical extinguishers.

The mill is lighted all through by 40-watt, tungsten lamps, the resulting illumination being even and bright without being too brilliant.

Sawdust and Shavings

The sawdust and shavings apparatus has one or two unique features which are well worth attention. On account of the fairly good market for sawdust it pays to separate it entirely from the shavings, and this has been done by installing two entirely distinct systems, which are so arranged as to furnish draught where it is most needed without using any more piping than would have been necessary had the shavings and sawdust been mixed together. The planer room, where the majority of the shavings is made, is situated at the extreme end of the mill, and nearly 300 ft. from the boiler house, therefore a double 14-in. fan is installed on the third floor of the mill directly over the planer room, which lifts the shavings through the fan and over the roof to about the middle of the mill, where they are dropped from a separator to a single 18-in. fan, also situated on the third floor, which acts as a relay, and drives the shavings over the roof to the boiler house. This 18-in. fan also carries shavings from the groovers and Linderman machines on the first floor, and from a small planer, also on the first floor, besides taking care of the various sweep-ups situated on all three floors, which are used only at certain times of the day.

The machinery was supplied by the following firms: Canadian Linderman Machine Company, Limited, Woodstock, Ont.; Samuel J. Shimer & Sons, Limited, Galt, Ont.; St. Paul Machinery Company, St. Paul, Minn.; W. B. Mershon and Company, Saginaw, Mich.; McGregor, Gourlay & Company, Galt, Ont.; Connell and Dengler Machine Company, Rochester, N.Y., and the Morgan Machine Company, Rochester. The saws are by the Simonds Canada Saw Company, Limited, Montreal; Henry Disston & Sons, Limited, Toronto, and E. C. Atkins and Company, Hamilton, Ont.

Mr. S. F. Rutherford is managing director of this company, and Mr. C. B. Fuller, Jr., is the superintendent. The mill was planned and built by them, and they are still working and planning to make it and its product better and to improve its operation, believing that the box business will be subject to improvements for some time to come, and meaning to maintain the lead.

One of the peculiarities of the California redwood seems to be its ability to resist the ravages of the white ants in the tropics. Because of this it is said that lots of redwood railroad ties are being shipped to India, where oak ties have proven unsuccessful because of damage from insects.

Tentative plans have been prepared for a technical school building estimated to cost $125,000, at Sydney, C.B. The enterprise is in charge of the Board of Education, of whose technical education committee, Mr. C. P. Moore, 688 George Street, Sydney, is chairman. The plans call for a building of two storeys with accommodation for about 1,000 pupils. In the basement of the building space has been allotted for the installation of woodworking machinery, it being the intention to offer classes in carpentry, joining, cabinet-making and pattern-making.

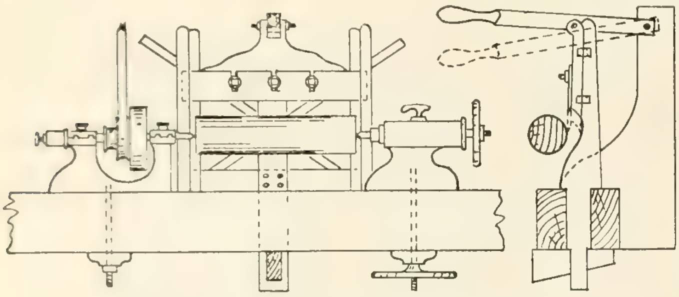
A remarkable piece of carved work was performed recently by a patient of an asylum in Kent, Eng. The patient, who was formerly a joiner at the Chatham Dockyard, is reported to have carved from some old oak a magnificent reredos screen for the church attached to the institution. The work took about seven years to complete and its value is placed by experts at $5,000. His first commission executed in the asylum was a handsome overmantel for the medical office Dr. Wolesley Lewis. This led the doctor to suggest other work with the result that he carved some altar rails and the reredos screen. Many of his smaller carvings are said to adorn the institution.

A Talk with the Cabinet-Maker and Machine Woodworker

By W. C. Jasbury

THERE is a saying that goes thus: "Wilful waste makes woeful want." I saw a case of this kind recently, while visiting a certain Government reservation, men were cutting down and burning red cedar trees, the real odoriferous red cedar, as used in moth-proof chests, closets, etc. This seems a shame, as this is the only known wood that will keep insects and such from a place where valuable clothing may be stored.

I once heard of mahogany being used for railroad ties in Honduras, as it was the only wood they had at hand in abundance and a railroad had to be built. These are two cases of wood, that is good for something, being wasted. Although I have some quartered oak sheathing on my own house, I bought it at a bargain, after a mill fire, in which it was charred and smoked to checking.



Sketch of alleged labor-saving machine.

I know of farmers using walnut for fence posts; and think of the gun stock trade, hunting their heads off for gun breech walnut. I know of a two-horse dump cart that has walnut sides and bottom. The country wheel-right had no other boards suitable for size at the time and the cabinet-making thought was not for him, he used walnut. There are many of these displays in wood consumption.

I recall an improvised contrivance in the shape of a semi-automatic turning lathe I once saw in the state of Pennsylvania; the reason for this invention was a small mill that had an order for four thousand chestnut cylinders, diameter five inches and length twenty-two inches. The system of turning them by hand was not altogether satisfactory to the manager, despite the fact that the turner on the premises was a fairly good one. However the manager wished to have his way and put a handy man (mill-wright) to work making a back knife lathe.

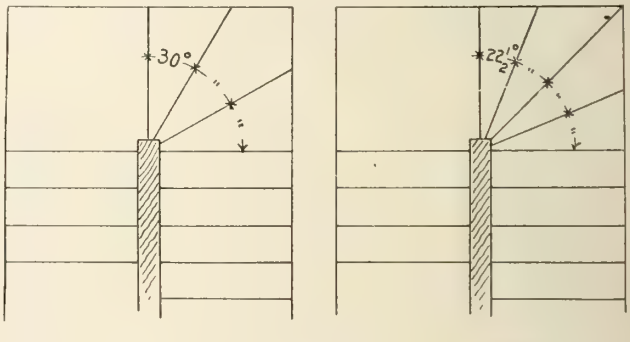
The knife part of this contraption was a twenty-four-inch discarded planer knife; nearly all of the rest of the make-up was wood. There was considerable difficulty in the production of the cylinders by this method, as some of the young trees were too large in diameter, but by the loss of much perspiration and time this monstrosity of a lathe did the work. I am quite sure a real (human) turner could have made the same product in less time, but that is not what this manager was there for. One thing I will say, the cylinders were all the same diameter when finished; this would have caused the turner some time, but they were not as smooth as though turned by hand, as the knife made a downward scrape cut, not a sheathing cut as a turner would. However, this job was completed and shipped.

Of course, I am not prepared to say whether or not any great amount of money was made, but it did make some cheap vaudeville for the shop boys, at any rate. The lathe was an ordinary old three-coned one, the back knife doing its dirty work from the coming-up side of the stick. The lengths were cut on an ordinary cut-off saw so the adjunct of a pair of cutting off tools was not used. These would have made it too complicated. I suppose at any rate when the job had been finally finished the manager handed himself boquets as large as umbrellas. Why, one would think he had invented a new fire box for an egg beater, or discovered some new grape juice. The boys had been watching the job so long they had really forgotten the beginning. I shall now endeavor to give you a sketch of this labor saving (?) lathe.

Take for instance a stair that has winders which are quite often used in rear stairs. Some of them have three and some have four winder treads, as shown in the illustrations. In the first case, the treads stands at 30 degrees and if in four parts 22½ degrees; 12 and 7 (practically) give the hexagon miter and 12 and 5 (practically) give the octagon miter. Mark on the side of the square on which the smaller number is taken.

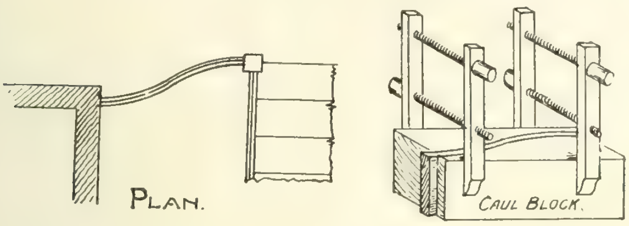
Recently I had a fascia board ⅞ by 12 inches by 3 feet long; and the shape was what might be called in R. R. parlance, a reverse curve; that is, it was curved concave and convex from a newel post, to a plastered partition, as shown in the illustration. To do this kind of work I take some spruce, hemlock, yellow pine or any cheap wood block and saw it on band saw to the required shape of the fascia. Then put the thin veneer pieces in the saw, cut block, first giving them a coat of glue and then put on the clamps and squeeze.

I recently had an occasion to visit a very fine residence in course of construction in the burgh; and the porch columns were of cement, fluted and with ornamental capitals. When they arrived on the site, they were 12 inches in diameter, instead of 14 inches, coming from a distance of 60 miles, freight, cartage, etc., to pay. The owner immediately notified the column maker, who shipped a man down, saw the "bull" and said: "Bury them in the back yard somewhere, as they are too heavy to send back, and we will send you the 14-inch columns. The 14-inch columns arrived later and were placed in position. The owner figured if he buried them in the back yard, in some hazy and smoky future, they might be dug up by some excavators, which might cause a panic among prehistoric hunters, professors, and other absent-minded data accumulators. Being a conscientious man, he did not wish to pull off such a joke on posterity, so he decided to build a pergoda. The aforesaid pergola is on the job, looking as healthy as pergolas go. No doubt, every time the owner takes a stroll under the spread of vines (not the grape-juice variety- on the pergola,



Lay-out of stairs for three winders and for four winders.

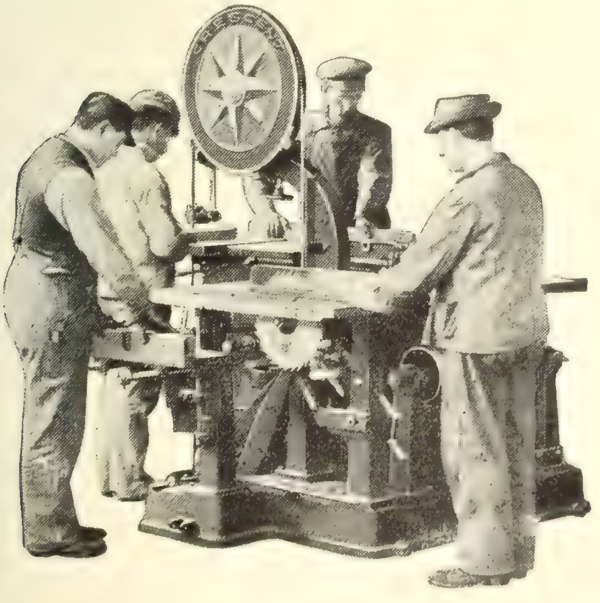
he chuckles to himself. Mr. Column Man was surely in "Dutch" that time, and not only that, I resurrected the poor columns, or better still, saved them from an early grave.



Blocks sawed to the proper curve assures success in handling curved veneering.

The Crescent Universal Woodworker

THE Crescent Universal Woodworker (H. W. Petrie, Limited, Toronto) is a combination machine of outstanding merit in regard to a number of improvements of interest to the up-to-date woodworker. By means of special attachments this machine can be adapted as a re-saw, hand-feed molder, tenoner, panel-raiser, pole-rounder, disk-grinder, knife-grinder, plain grinder and hollow-chisel mortiser. An important feature of this combination is the absence of separate countershafting so that all the space around the machine is left clear for the convenient handling of the lumber. It is also claimed that the material being worked is handled as conveniently as would be possible with the usual separate machines, each machine being started and stopped independently with its own lever. Another advantage possessed by the Crescent Woodworker is that it is not necessary to run more than one machine when only one is in use, while four persons may use different machines at the same time without disadvantage. There are no difficult or complicated adjustments to be made for doing different kinds of work, as each machine is ready for the performance of its intended work. The base is made in a single casting, with planed-off surfaces, or pads, upon which the various parts are mounted. This ensures stiffness, accuracy in alignment of the machines, and complete absence of vibration when running. The base is provided with three large casters to facilitate the moving of the machine on the floor.



The Crescent Universal Woodworker.

There are five units proper to the completed machine, viz., a band saw, a jointer, a shaper, a saw table, and a borer, each unit having all the conveniences and refinements of an individual machine. The Universal Woodworker is furnished with either a 26-inch or a 32-inch band saw, or, if, desired the band saw may be omitted entirely. The jointer is of rigid design and practically of the same form of construction as the regular Crescent jointers. The frame, with bearings, is cast solid in one piece. It is mounted on the heavy base on planed-off surfaces, giving the machine absolute stiffness and stability. It is furnished with a four-sided square head, has two sides adapted for using the regular straight knives, and two sides with T slots for attaching special knives. With each jointer is furnished one pair of straight knives, one fence, one hold-down spring, jointer guard, one wrench and endless leather belt to drive the jointer from the drive shaft on the machine. The shaper provided on the Universal Woodworker is of the single spindle, reversible type, and it is claimed that the machine is as convenient and will do as much work as can be done on a separate machine. The saw table is of rigid construction, well adapted to general shop and factory use, and the equipment furnished with each machine is one 12-inch rip saw, one ripping fence, one cut-off fence, and an endless leather belt to drive the saw-mandrel from the drive shaft on the machine.

One way to insure efficiency in your power plant is to use motors, buy outside power and let the power organization look after that end of it.

Visitors to the Canadian National Exhibition this year will have the opportunity of witnessing hydro-aeroplane flights. Arrangements have been made whereby W. A. Dean will fly his machine daily, starting from the lake and circling over the Exhibition Grounds. These flights will be given at various intervals during the afternoon, but one will be held at the fixed hour of six o'clock every day.

At the annual meeting of the Canadian Manufacturers' Association, held in Montreal, Mr. W. L. Edmunds, of Toronto, referred to Canada's large importation of furniture, which he said amounted to about $3,000,000 a year. Both the government and the railways were buying abroad, while Canada might produce the same high-class furniture. He suggested that the matter be taken up by the executive.

A course of lectures on furniture was provided for recently by the London (Eng.) County Council. This means of acquiring valuable knowledge of furniture is being taken full advantage of by large numbers of furniture workers. The example of London is worthy of being imitated in the large centres of Canada where furniture manufacture is developing rapidly.

According to estimates of experienced men, it costs about twice as much to work oak in the planing mill as it does pine. The exact figures in one case show $25.52 as the total cost per 1,000 ft. for working pine and $54.65 for oak. Of course, figures will vary in different cases, but there is evidence that the kind of wood used is quite a factor to consider in planing mill cost.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Q.—"We would be glad to hear from some of your readers their opinions as to the general safety devices actually required in woodworking factories. In other words, how far should one go with the 'Safety First' movement that we are hearing so much about just now."

A.—When all is said and done, the only real safety device is the careful man, and in general it is better not to try to make saws, knives, etc., too nearly fool proof, lest we remove from the workman his most valuable asset, which is his caution. Most of the ready-made safety devices are costly and being separate from the machine are easily forgotten, or being in the way are not used, unless the eternal vigilance of the foreman prevents it. Then the man who has been used to a guarded machine forgets that there are teeth in a saw and loses his fingers, or worse. It is true that it was the man's fault, for the guard was there, but the employer has to pay the doctor and the half-time just the same, in addition to the cost of the guard which, after all, did not prevent the accident. Therefore, in guarding saws, knives and all cutting edges, make these guards yourself and make them part of the machine, so that the machine cannot be operated unless the safety appliance is in place. Do not completely cover saws, for it is necessary for the operator to see the saw to handle it safely, and do not make it impossible to withdraw a piece from the saw if it should be necessary to do so. Build wooden frames around all your exposed belts, gears and shafting on or near the floor, and replace regular set screws with blind ones. See that your hoists are protected with automatic gates or doors. If you have done the foregoing and do not employ inexperienced men on dangerous machinery, you will have fulfilled all the requirements of the "safety first" principle. This question of safety in factories is a large one, and we would be pleased to have the opinions of others as to what is and what is not necessary the best to safeguard both employees and employers.

Q.—"One of our shavings fans, which is a standard Sturtevant machine operating in an 18-inch pipe line, has always worked most unsatisfactorily, and the closest search has thus far failed to reveal the reason. The diameters of the inlet pipes in various parts of the mill are, altogether, less than the diameter of the inlet to the fan, and the outlet is clear and free, with no sharp bends and discharges into a cyclone through a nozzle 12 inches by 16 inches, having about the same circumference as the 18-inch pipe. In spite of this, however, and the fact that in our attempts to improve the draft we have speeded the fan to its maximum, about 2,800 r.p.m., we get a draft of only about 2-inch water column while the pressure on the discharge pipe is about 7 inches."

A.—You have really answered your own question when you state that the discharge end of the pipe measures 12 inches by 16 inches. It is the **area** of the opening that counts in pipe of this kind and when the end of the 18-in. round pipe was squared to 16-in. by 12-in., a considerable reduction in area resulted which is responsible for the high pressure of your discharge end and the low suction, as it is impossible for the fan to draw in through its various inlets, more air than it could discharge through its nozzle. The area of an 18-in. pipe is 254.47 sq. in. while the area of a pipe 16-in. by 12-in. is 192.00 sq. in. This makes your discharge end 62.47 sq. in. smaller than the inlet and this is your trouble. Make the outlet to the cyclone 16-ins. square, which will give you an area of 256 sq. in. and your draft will be greatly increased. This is a common error among sheet metal workers, and one which few would suspect until the reason is pointed out.

Q.—"Are motor trucks a paying investment in the lumber business, and if so, what size and type is the most satisfactory?"

A.—Motor trucks are without question the best and most economical means of moving any material where the roads are not too soft or too rough and stony. Even under the most adverse conditions, they compare favorably with the horse haulage, but in making a change involving a large investment a considerable saving must be assured. In order to assure this, the condition of the roads must be taken into consideration. Grades do not hinder the truck, in fact the more grades the better the showing, but the better and smoother and more level the roads are, the cheaper the maintenance from every point. A truck for hauling rough lumber or finish, or both, should be either a 3 or 5-ton machine, or if two are required, these sizes work well together. The loading space should be as far front as possible and should be six or seven feet by twelve feet with not over four feet overhang beyond the rear axle. The floor of the body should be smooth and lined with galvanized sheet iron and should be fitted with pockets for stakes or side boards, and provided with at least two binding chains permanently attached to the body. The cars should be equipped with a power dumping device operated by the engine which will tip the body to an angle of 45 degrees. Strong heavy machines should be selected, and they should be properly housed and cared for, particular attention being given to keeping bolts and nuts tight. Take your own team drivers and have them educated by the makers of the truck. Under these circumstances a truck should have a useful life of ten years at least, and will save from 25 per cent to 50 per cent of your transportation charges.

Q.—"We require a general utility saw, groover, etc., for use in our stair department, and would be glad to know if you can refer us to some one making a universal saw bench which will handle some of the cutting and grooving operations which now have to be done by hand or taken to various machines around the shop."

A.—The best tool we know of for all-round work in a department of this kind, where the work is best done away from the regular factory equipment, is the Elliot No. 2 Woodworker, made by the Elliot Woodworker Company, Toronto, Ont. This is a motor-driven portable machine which will run from any electric light circuit, the head or arbor of which can be raised or lowered or turned to any angle with the work supporting table. The arbor will swing a saw or any form of cutter and handle any grooving, sawing or babbetting operations such as are required in stair building to very good advantage, besides which it is light and easily moved to follow the work. If you have power handy and do not need a portable machine, there are any number of universal saw tables which might serve your purpose. Besides these there is a machine made by the P. Pryibill Machine Company, 512 W. 41st street, New York City, which is built in the form of a straight moving swing saw, and which in connection with an adjustable table makes a machine which has many good features for this class of work. Each has its peculiar advantages according to the requirements.

Q.—"Could a man get a sufficient shock from a 500-volt circuit to cause death?"

A.—He certainly could, depending upon his position, clothing, etc. A shock received from a grounded wire such as would result if there was trouble with fuses and the man had one hand on the iron box while he replaced the fuse with the other, would cause a direct circuit to be established through the vital organs and would prove fatal, while a shock through the legs might simply be uncomfortable, depending upon the wetness of the hands, the thickness of the shoes, the dryness of the floor or ground. One cannot estimate beforehand the severity or effects of a shock from 500 volts or more, so attend strictly to business when working around charged wires. Be sure you have a dry plank under you when replacing a fuse in a live circuit and keep one hand behind your back.

Q.—"I have been told that a little machine oil poured on top of hot babbitt just before pouring will assist in making it run smooth. Is there anything in this?"

A.—Babbitt metal being a mixture of two or more metals which may or may not be alloyed, tends to separate when hot and therefore must be stirred slowly while pouring, as it requires everything as clean as possible to secure good mixture and a good bearing. You do not see a tinsmith put oil on his joints before soldering. On the contrary, he uses a flux to clean the joint and prevent an oxide from forming which will spoil his work, and it is the same with babbitt. Everything must be as clean and dry as possible. If you anticipate any difficulty in getting a good bearing, heat the box and the arbor a little before pouring. Do not heat your babbitt too hot; just enough to char a pine stick without burning. It is right for all except the very hardest babbitt.

Q.—"Can you give us any information as to the appropriateness of group or individual motor drive in woodworking plants? We have 220-volt circuit and wish to use squirrel cage motors as far as possible on account of fire risk."

A.—Each form of drive has its advantages and the best equipped mill is one which uses both according to the requirements. If several machines which must operate at about the same time are close enough to be reached by a shaft of moderate length, say 25 feet, group drive is best, for in this way the motor is allowed to start under a light load of shaft and belting only and the machines may be started one at a time. The squirrel cage motor exerts a comparatively small starting effort, while the expenditure of current is very large, therefore in group drive the motor may be made small and run at or near its proper rating, where its efficiency is greatest. Where machines are isolated or require large power, separate motors may be installed and it will give good results if the proper size is chosen and the motor is neither too large nor too small. Where a machine is hard to start, it is best to drive through a countershaft and bring the motor up to sped before starting the machine by shifting the belt as usual. If direct connected motors are used in such cases, they must be large enough to carry the starting current safely, which may be double the running load. A direct connected motor under these conditions is very wasteful of power, besides costing more in the first place.

Q.—"Can you advise me as to a good furniture polish for pianos and furniture? If so I should be glad to know how it is made and what it is composed of."

A.—The following recipe is said to have been used to good advantage:—Beeswax, 2,500 parts; potassium carbonate, 25 parts; oil of turpentine, 4,000 parts. Dissolve the potassium carbonate in 1,500 parts of the water and in the solution boil the wax, shaved up, until the latter is partially saponified, replacing the water as it is driven off by evaporation. When this occurs, remove from the fire and stir until cold. Now add little by little and under constant agitation, the turpentine, stirring until a smooth emulsion is formed. Add the remainder of the water under constant stirring. The directions for using are very simple: First, wash the surface to be polished, rinse and dry. Apply the paste as evenly and thinly as possible over a portion of the surface, then rub off with a soft woollen cloth.

The Economy of "Safety First"

Manufacturers are emphasizing the fact that safety is the first consideration in the conduct of operators. The personal injury question is regarded as an inseparable part of overhead and liability, for it is not evaded. The movement for safety first is not confined to the American Continent, but is world-wide.

In 1911 and 1912 one corporation spent considerably over a million dollars on guards, signs and other safety devices, and since 1906 the fatal accidents among their employees have been reduced forty per cent. In other words, the safety devices in but one field of endeavor have saved the lives of about 8,000 men, which is a remarkably good return on the investment.

It is clear that the management is doing all it can to minimize accidents; for their own interests are protected, and they reduce to a minimum the cost of liability for compensation for injuries to employees.

This elimination depends also on the alertness and intelligence of the men in realizing the danger they have become oblivious to by daily contact.

Necessity of machine care and safe-guarding has ever been realized. Skilled machine operators are as vital to production as are the machines employed, and as such should enjoy an equal protection as compatable with the most efficient means of production and quality.—Berlin Quality.

Recklessness around dangerous machinery is not a sign of bravery or personal courage, but an indication of foolhardy posing.

The Hardwood Market

WHILE the course of events in the hardwood market has been practically unchanged for several weeks past, the latest reports from representative hardwood men point to the fact that conditions generally are much more satisfactory, and that there is an upward tendency in the trade barometer. This is revealed in the more confident tone which has taken the place of the feelings of depression that have been abroad for the past few months. Furniture manufacturers have been curtailing their operations considerably, owing largely to There is a well-defined belief, hoewver, that an abundant crop return will have the desired effect of bringing few large orders for hardwoods have been obtained. trade depression in the west, with the result that very about good business in the fall. No doubt if the prospects in view materialize, a considerable impetus will be given to the demand for hardwoods. Reports to hand from various centres announce that about the only consuming factories using hardwoods, which are busy, are the wagon manufacturers, many of whom are resuming full time operations. This is the direct outcome of the reassuring crop reports which, moreover, cannot fail to strengthen the general stability of the situation.

A feature of the market which is highly encouraging is the fair level of prices which is steadily maintained, though the market level for this period of the year has not fulfilled expectations. When additional demands are taken into consideration, there is no valid reason for undue pessimism on the score of prices. Discussing the situation, the American Lumberman says that as the year becomes older an increased movement may be looked for as so far this year buying has been of the hand-to-mouth kind, with the result that stocks in the hands of the consumers are low. The furniture factories will undoubtedly get into the market after the July expositions are closed, and already hardwoods show signs of activity at some of the prominent centres of furniture manufacture. Discussing other aspects of the trade, the same Journal says, "machinery and vehicle interests, too, are doing a big steady business and are constantly in the market. Box manufacturers have been taking care of all the low grade cottonwood and gum offered but the railroad buying has been far below normal. Building operations throughout the country have created a big demand for interior finish goods, export business showing some improvements. Gum and oak lumber movement is higher. The overseas movement in logs, however, continues light."

Hardwood Record, taking a general view of the conditions, says: "Generally speaking, with the exception of a slight depression in oak and a continued feeling of betterment in the gum situation, the developments as regards the various members of the hardwood family are about the same as formerly. There does not seem to be any logical reason why the relative condition should alter materially in the next few months and it is not at all likely that this change will come to pass. A gratifying feature of the situation is the continued maintenance of a reasonably fair level of prices, though, of course, the market level is not what it was hoped it would be at this time of the year. Still, considering the actual condition of demand, hardwood lumbermen should not feel unduly discouraged regarding prices they are getting for their stock. With a considerable number of mills in the various hardwood producing sections shut down for substantial periods of time, with the present healthy condition of stocks, there not being any remarkable accumulation at any point, and with the entire probability that actual demand for hardwood lumber will be considerably augmented in the fall months, the indications are that when the stimulus comes hardwood values will be very materially strengthened."

The Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., July 15.—Business at present is at the lowest ebb of the year, largely because the furniture trade has been marking time, as far as buying is concerned, while awaiting the results of the semi-annual exhibitions. Manufacturers and consumers of lumber have been taking inventory, and getting ready for the latter half of 1914, regarding which diverse opinions are being offered. In some directions it is held that every indication points to good business this fall, this prediction being based, of course, on the assumption that crops will be satisfactory. The winter wheat crop turned out exceptionally well, and if spring wheat and corn do equally well, there will undoubtedly be a good foundation upon which to build.

During the past six months there has been a considerable shrinkage in hardwood lumber values. Plain oak, as has been indicated heretofore in this correspondence, has been hardest hit. There is a conisderable overstock of this wood, in both red and white. All grades seem to be dull, especially No. 1 common and better. The low grades have been moving fairly well, but not nearly so well as they were expected to do. The condition is in sharp contrast with last year, when plain oak was the "one best bet." This probably led to many manufacturers of quartered oak, which was in only fair demand, deciding to plain saw their oak logs, the result being that, with a slump in demand, there was a considerable over-production of plain oak. Values are probably 10 per cent less now than they were January 1. In view of timber values, however, and the fact that no decrease in price has been noted lately, in spite of a continued poor demand it looks as though rock bottom on plain oak has been reached. The consumer who needs oak can scarcely find a better time than the present to stock up. He can get lower prices and better grades, as well as more concessions as to widths and lengths now than he will be likely to do in the fall, after active buying is resumed.

As suggested above, the pendulum swung last year from plain oak to quartered. This is about the only hardwood of major importance which has held its own during the past six months both as to demand and price. It is now holding firm, and the movement is well up to normal. Though mahogany men do not believe that this is the case, it is possible that some manufacturers who have been using mahogany are now reverting to oak in order to make use of the brown finishes which are coming in with the revival of popularity of black walnut and other brown woods. Mahogany, however, is selling at a lower price than for some time, and may be had on more favorable terms.

The brown wood era, about which so much is being said, seems to be an accomplished fact, or at least to be a feature of the situation which everybody must reckon with. The advent of this era, it is said, is due to the fact that reds have been overworked. Mahogany has been and still is immensely popular, but it has been the victim of unrestrained imitation. Everything that could be has been "mahoganized," and it has suffered along with quartered oak, which lost prestige on account of the appearance of "American quartered oak," finishes in extremely cheap furniture, this effect being secured by a printing process. People are turning away from the reds as the result of overdoing the thing, to the quiet, elegant and rich effects made possible in the browns. Black walnut, figured gum and Circassian walnut are naturally brown woods, and oak can be readily stained that way, so that there is no difficulty in the way of giving the public what it wants, if this is indeed what it desires.

Speaking of quartered oak and its fine position in the market, quartered red oak is extremely scarce, though a greater quantity is almost ready for the market. While plain oak was getting the better of it in price and demand, few manufacturers cut any red oak into quartered stock, the difference in price being too little to justify it; but a good deal more quartered red oak is now on sticks and is about ready for the market. Quartered red oak strips appear to be particularly scarce. Basswood, which is a very popular wood with furniture manufacturers for corestock purposes, has been unusually active of late, and in fact is one of the few woods on which prices have been advanced. Panel plants and others have been buying freely, although general trade conditions have not been particularly favorable to a large movement of any stock. Sound worm chestnut, the other prime favorite for corestock purposes, is moving less actively, but prices are about stationary, quotations f.o.b. Ohio river crossings being in the neighborhood of $19.50 to $20.

Veneer manufacturers report conditions quiet, but certain producers of sawed stock have received a considerable number of carload orders, indicating that some consumers, at least, have faith in the situation.

The Galt Knife Company, Limited

The new plant of the Galt Knife Company, Limited, Galt, Ont., manufacturers of machine knives, is located on a splendid factory site in the southern section of the town of Galt, on the east side of the Grand Trunk tracks, and adjoining the new line of the Lake Erie & Northern Railway.

The building, which is 40 x 140 ft., is of handsome appearance, and is in every way admirably suited for the location of the extensive manufacturing plant operated by this enterprising company. The foundations are concrete and the structure is of red pressed brick piers, with steel sash used throughout, giving splendid light and ventilation. Georgia pine has been utilized in the construction of the building, with the exception of the office, which is finished in Cypress. All the departments are equipped with machinery of the most modern type, quite a number of the furnaces and grinding machines having been constructed from special designs worked out by the company, which designs are said to be the last word in the heat treatment and manufacture of steels for the various requirements of the woodworking industry.

The operations of the firm are not confined to the manufacture of machine knives. A complete line of metal cutting shear blades used by structural steel plants, boiler shops, stove foundries, etc., is also manufactured. The plant is now equipped to handle blades of this description up to 120-ins. long.

Mr. Thos. Vair is president, and Mr. Ward Vair, managing director of the company.

A Pioneer Ontario Woodworker

The subject of our sketch, Mr. Thos. Jas. Storey, was born in Escott, Ont., in 1857. He has been identified with the woodworking industry all his life and has been president of the Canada Carriage Company, successors to the Gananoque Carriage Company, Brockville, Ont., since 1905. Mr. Storey occupied the position of foreman painter in the Gananoque Carriage Works in 1883, superintendent in 1885, managing director in 1892, vice-president and manager, Canada Carriage Company in 1893. He is also vice-president of Carriage Factories, Limited, and Ontario Wheel Company, whilst he is a director of Port Arthur Wagon Company, and Brockville Atlas Auto Company. Mr. Storey also interests himself in municipal affairs, having been town councillor, water commissioner, and president of the Board of Trade. He also filled the position of president of the Brockville General Hospital for a period of five years.

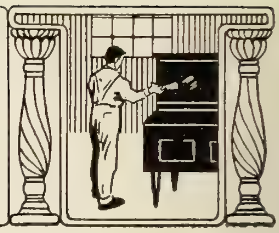
Mr. T. J. Storey, Brockville, Ont.

A good factory rule to keep in mind is that you can move material along six feet on a level floor while you are moving it one foot upward toward a second storey.

Finish is really a prime factor in wood work, as well as an important essential, and this subject needs more study and attention, with the purpose in view of bringing out the best effects. One of the troubles with the finishing room in the past has been that lots of the thought given to it has been centered on the matter of reducing the cost and seeing how cheaply the finishing end of the work can be done. The result has been unnecessarily to cheapen products.—Veneers.

Sugar maple stands near the top of the list of furniture woods in this country. The so-called "birdseye" effect is probably due to buds, which for some reason cannot force their way through the bark, but which remain just beneath it year after year. The young wood is disturbed each succeeding season by the presence of the bud, and grows around it in fantastic forms, which are exposed when the saw cuts through the abnormal growth.

THE FINISHING ROOM



The Nature and Use of Varnishes

VARNISHES in common use are three in number, namely: fixed oil varnish, volatile oil varnish, and spirit varnish. The first named varnish is the most important of the three, and, correctly speaking, has no solvent, it being necessary to melt its gum in order to make the varnish.

Volatile oil varnish is represented by dammar varnish, the dammar gum being dissolved by turpentine. There are several of these soft gums that may be dissolved by turpentine. They have neither durability nor gloss, being used chiefly for making enamel paint, or for varnishing maps, wall papers, etc.

Gum Shellac and Other Varnishes

Spirit varnish is represented by gum shellac varnish, the gum being easily dissolved with alcohol, either in the cold or warm state. Spirit varnish is useful for giving a finish to certain kinds of furniture, and for giving a finish to tool handles, etc. Shellac has a very limited value as a varnish, its chief value being as an under coat for oil varnishes, or for interior finishes, for it is incapable of standing exposure to the weather. It is lacking in durability and elasticity.

The fixed oil varnishes consist as a class of vehicle, house, cabinet and furniture varnishes. They are composed of a fossil gum, linseed oil and turpentine. The gum has the generic or family name of "copal," a name applying to all fossil gums. There are Zanzibar copal, North Coast copal, Pebble copal, Manila copal, etc., according to the locality whence they are derived. Amber, from which articles of jewelry, etc., are made, is simply a copal or fossil gum, and varnish is sometimes made from it, it being a very hard gum. These fossil gums were juices of trees of a very remote age—perhaps antedating the earliest dynasty of the Pharaohs.

Zanzibar and Kauri Gums

Zanzibar gum is by far the best ever found but the supply seems to be practically at an end, the island of Zanzibar having been dug over by the natives several times, and the supply, very small at best, is yearly decreasing. New Zealand is now furnishing a considerable supply, and much comes from the Philippine Islands. That from New Zealand is known as kauri gum, and is the most useful varnish gum we now have in any considerable amount. The gum is a product of the kauri tree, which is still in existence, though the new gum has no value for varnish-making. The fossil gum is found in the soil at no great depth, natives locating it by prodding the earth with pointed irons.

The making of varnish is apparently one of the simplest of operations, involving merely the boiling of some gum with oil and turpentine. A certain quantity of the gum is placed in a copper kettle over a fire, where the heat slowly melts the gum. Then some prepared linseed oil is added and the mass is stirred, after which it is boiled some more, then some turpentine is stirred in, after which comes the straining and filtering, and the varnish is done.

But the utmost care must be exercised from the first in order to get a perfect result. The gum is first carefully sorted and graded, each grade for a certain class of varnish. Correct weighing of the gum is necessary. The cooking of the gum must be watched carefully, which is done by the cook with a stirring rod; the proportions of oil and turpentine must be just so. Guesswork is never permissible in making varnish. It requires years of experience to make a good varnish cook.

Ageing of the Varnishes

Another thing, although the same formula may be used, the same gum, etc., and the same varnish maker, yet there is one more essential to success, namely, uniformity of quality, which can only come from large tankage capacity and ample time for ripening. Unripe varnish will not, cannot give good results. And this ripening cannot be produced by artificial means. It is said that whisky may be made old in twenty-four hours. Not so with varnish. It requires from three to twelve months, according to the grade.

In order to allow the varnish ample time for aging it is necessary to have a vast quantity of it in tanks, and this is one of the heaviest items of expense in connection with its manufacture. To fill orders, however large or frequent, means to keep up a large stock of the fluid. Hence it is that some inferior varnishes might be excellent if only they had had time for ripening. A varnish lacking in age will cause trouble in sweating out.

The varnish maker has hundreds of formulas for making varnishes, from the best down to the worst, or perhaps it should be said down to the cheaper ones that are just as useful for their purposes as the costly ones for theirs. Here is a formula that will illustrate the class of low-priced varnishes, of which much is used in cheap and medium grades of furniture, house work, etc.:

Melt in the kettle 100 pounds of Manila copal gum and 50 pounds of hardened rosin. In another kettle place 12 gallons raw linseed oil and boil with 15 pounds of dry pulverized litharge and 1 pound borate of manganese until the drying mediums are well taken up, when the oil is placed in the kettle with the mixed gum and rosin, and the whole fused by keeping it on a low fire until amalgamated, when the kettle is taken to the thinning room, where 10 gallons of spirits of turpentine are added first, then 15 gallons of benzine. When this varnish is well made and filtered and aged by settling it will dry hard enough in twenty-four hours to be rubbed with pulverized pumice stone and water without turning white, so it is claimed.

Importance of Having the Right Varnish

There are many varnishes for many purposes. It is very important to select the right varnish for the work in hand. Even price alone will not guide one. We may think that as the work in hand is low-cost work we may as well take any low-cost varnish, but there may be one of the low-cost goods better for this particular purpose than another for the same class. This is why a finisher should have a good working knowledge of the nature and methods of manufacture as well as the uses of varnishes. Correct knowledge along this line would enable him to avoid many varnish troubles.

Most responsible varnish makers make varnishes for all special purposes, and it is safe enough to use these upon faith rather than take chances when one is not well versed in varnish-making. It may safely be believed that the best varnish is the cheapest, and probably no one who buys and uses varnish in a commercial way, as in a finishing room for instance, will dispute this, though they no doubt will say that it must often be a matter of price. We all know that it takes just as much time to apply a poor varnish as a good one, and we also know that varnish is great for spreading over a surface, hence a little goes a long way and would often seem to warrant good goods when very inferior goods are used.

In the Varnishing Room

One of the most important matters pertaining to the varnish room is ventilation, to allow of the carrying away of the gases arising from the drying varnish, and to provide a free circulation of fresh air, without which varnish will not dry properly. Often a poor luster is due to an impure air, for it is well known that plenty of fresh air, barring drafts, will produce a better gloss. Drafts, particularly cold or damp drafts, are bad for a varnish room, and are to be avoided and watched for, especially in changeable weather. It is a good plan to have hinged windows inside of the regular windows, these not affecting the entrance of light, but preventing drafts.

The varnishing done in the morning has all day for drying, which is desirable, as then the temperature is not so variable as at night-time.

The varnishing room should be tight, but yet have ample provision for ventilation, the fresh air coming in near the floor and having an exit near the ceiling.

An even temperature is important in the varnish room, and a pretty high one, too—say 72 degrees. Varnish spreads much easier when work and varnish are both warm. Have a thermometer in the room, placed about where it can register the average temperature of the room.

Steam or hot water heating in winter is the best kind—much better than a stove or hot air from a furnace. If a stove is used, then let it be in an adjoining room, with the heat entering through a pipe.

In the varnishing room should be a closet for keeping the brushes and cans of varnish, also the varnish pots or cups. Keep the varnish brush clean all the time. Put it away clean. A half-elastic brush is best, for a too stiff bristle will cut the varnish and show through; or if too soft of bristle it will not spread the varnish well.

Give the filling and varnish coats plenty of time for drying. Soft or undry undercoats will absorb the oil from the upper coat and cause sinking in, sweating,, etc.

Beware of greasy fingers and moisture, temperature variations, etc., and all other like evils that cause trouble.

If you would have a full gloss never work the varnish much with the brush, but flow it on quickly and deftly.

It is surprising to see how careless some varnishers are when it comes to applying the rubbing, the result of which is seen in a ridgy surface that will take a lot of work to make smooth. Take time and pains to get the coat on smooth and level and of uniform thickness. This will save you hours maybe of hard rubbing, with a possibility of a good job with hardly any rubbing.

The idea of rubbing a piece of varnished furniture or house fitment is to dull the gloss and make a surface like a piece of dulled plate glass. When the vehicle varnisher rubs out a job it is with a view to getting a level and smooth surface for the finishing coat, which always is a gloss. There is that difference in the work of the two, but the end is very much the same —a smooth and even surface. It is not necessary to have any brush marks to rub out if you will apply the varnish right. It is difficult to rub out the brush marks, and when they have been removed it will be found that most of the varnish also has been taken off.

Some finishers advise a little finishing with the rubbing varnish, say one tablespoonful to the pint of rubbing. But oil should never be used for slowing up a too-quick rubbing varnish. It is a good rule, too, to doctor varnish as little as possible, it being better to get the right kind, one that will require no doctoring. However, a little finishing in rubbing varnish can do no harm.

One of the most important and easily made tests for a varnish is to varnish a prepared board with it and let it become perfectly dry, just as in ordinary varnishing practice. Then place a wet sponge on it and let it remani so overnight. If the varnished surface shows up bright and clear next morning it may be accepted as a durable varnish. But if it shows up white, then it has absorbed water, and of course is not proof against water or weather. If it remains white after it has dried out it proves that the water has dissolved part of the varnish, and hence it is not fit for any purpose where water or dampness can get at it. In fact, it contains rosin, which is easily affected by water.

It is not a good sign when a varnish dries too quickly, as it shows the presence of too much drier, and driers are injurious to paint or varnish when used to excess.

A varnish that will dry over night so as to allow of being touched without marring is good enough for ordinary furniture or house work. This is assuming a temperature of summer heat, or say about 72 degrees Fahrenheit. In damp or cold weather it is better not to apply a second coat too soon, but to allow extra time for drying.

We hear of a varnish that dries from the bottom up, and of others drying from the outside. The expression "drying from the bottom" means the difference between the surface drying of boiled oil, the principal thinner in ordinary oil varnish, and the more uniform drying of raw oil, or raw oil with driers added, as in paint. Literally considered, the statement is incorrect. Oxidation must occur at the surface of the oil, or paint, or varnish, as the case may be, and not at the bottom. The term drying from the bottom up, as explained, indicates a certain process that is different from the usual drying of paint or varnish that is a strong self-drier or that has had driers added.

It would require more space than I have to fully explain this matter, though it is important to know about it. Both raw and boiled oil dry by absorbing oxygen from the atmosphere, but raw oil takes it up very slowly and it permeates the oil entirely in time, thickening it and making it quite gummy long before the surface is really dry.—Wood Craft.

The Use of Bichromate of Potash in Stains

Contributed by Walter K. Schmidt.

UNDER the caption "The Practical Character of Wood Stains," there appeared in the March issue of the Canadian Woodworker an address delivered to cabinet-makers in London, Eng., by Mr. Chas. Harrison. Regarding bichromate of potash, as used in stains of various sorts, especially mahoganies, Mr. Harrison made statements calculated to mislead the practical man in charge of American finishing rooms.

I must give the gentleman credit for treating the subject in a most scientific manner, but I feel (and base it upon my years of contact with the man at the bench and the man in charge of our finishing rooms) that the article is too scientific to be digested or even appreciated by the average craftsman.

Further, I am on record as having recommended in these columns the use of bichromate of potash. Don't misunderstand me, I said "bichromate of potash" and not any of the other chrome salts that he refers to. Undoubtedly, he is not familiar with our methods, otherwise he would not have brought up the other chromium salts for consideration in an address to craftsmen who are not chemists. To me, as a chemist, the article is very good reading. His points have been known to us for years, and he seems to impart the idea that the entire color scheme depends upon the action of chromium. In taking up the matter of the article, I am going to treat it in the plainest possible language, believing that the man who has to use this material is not so much interested in the scientific end of the topic as he is upon the results whether they are permanent or not. Therefore, I shall eliminate the discussion of the chemical points involved, and give only the actual action and results obtained from this chemical which to my mind and from my experience has proven one of the most valuable agents for producing results in the finishing room that we have found.

This sentence "We now find that the stain undergoes a change on or immediately after application, and that such change is intentional. But is this change absolute or final? This, I feel convinced, is not the case," is the statement that I wish to dispel from the finishers' mind, taking into consideration the chrome salt that we employ, the method in which we employ it, and the treatment it receives after being used in making a stain, in the modern furniture factory. In almost every case of making mahogany, we use in conjunction an aniline, thus relying upon the color produced by the combination rather than that produced by the chrome salt only, but so broad a statement as above referred to would create in the mind of the manufacturer of furniture a doubt as to the permanency of his stain, and thus cause him to change his mode of stain only to find himself in troubled waters.

Reverting to the fact that to-day almost all our mahogany stain is produced by a red and a brown aniline, the brown being nothing more than a black and an orange mixture, and that years of experience have proven beyond a doubt that the addition of bichromate of potash in reasonable quantity produces better results, should be sufficient evidence that it is safer to let well enough alone than to allow doubt to creep in our minds by an article published broadcast by a man who puts himself on record by saying "For example, I have been connected with the trade for nearly thirty years and have never even heard a polisher mention them; neither, of course, have they been called for." We must allow for the fact that this article was read in London, England, where they call the finisher a "polisher" and where, taking this man's statement as a fact, for thirty years back they haven't heard of bichromate of potash as being used in the production of mahogany stains. Yet the man undertakes to create a doubt as to the value of this commodity in the minds of his fellow craftsmen, to whom he is talking.

To me this matter is of the utmost importance. Not only do we use bichromate in the mahoganies, but our modern fumed oak, when not produced by the fuming process, depends largely upon the chemical action of bichromate of potash, when used in conjunction with other chemicals. In the article we are told of oxidation and reduction that does or may take place, after a solution of this salt has been applied to the wood; also how it is used to make an imitation of Sheraton, Adam and Chippendale mahoganies. In conjunction with this is the statement that the man when buying a piece of this furniture, and supposedly buying it as an antique, produced previous to the year 1797, would find that his piece of furniture might be but six months old, but designed and built on the lines of the above mentioned period. The manufacturer of to-day who puts out period furniture does not do so to hood-wink the people. He makes period furniture, but the consumer knows that it is of modern manufacture, though built on the lines of the old masters, so that the detection of the use of bichromate of potash would not signify anything. Suppose the chemist does scrape off the varnish, and then part of the wood, and by a very careful analysis finds the presence of bichromate of potash. What would it signify? You might as well say that he finds some glue. Finding the potash would signify no more than finding the glue. The fact of the matter is that in the able article referred to the subject is treated by a man who evidently knows the details of chemistry, and the possible changes that may and do take place; but what does it all signify to the practical man who wants results, and knows that he gets them? Why disturb an industry with a scientific treatise, the respect for which might create so much distrust in a commodity recommended and sold by almost every stain house in the Western Hemisphere?

Reverting again to my statement of our use of bichromate of potash, let me say that years ago the chrome salts were all tested from the roof of a large factory. The writer placed a collection of boards, stained in various methods, with different chromium salts, part exposed to the sunlight and part securely covered. I must add to this statement, however, that the experiment was conducted in a photograph gallery which was situated on the roof of a building, and thus the samples were exposed to strong daylight and sunlight for six months. The experiment clearly showed that in every instance where bichromate of potash was used the stain was permanent, and naturally the question arises, why? In a practical way let me explain it. The bichromate assists in the penetration and in this penetration carries with it the color of the anilines, thus impregnating the wood more equally and more uniformly than without. Whatever change in bichromate takes place, it has been considered in the preparation of the formula. We know and count upon a certain amount of color produced in making up the formula, and in consequence use proportionately smaller amounts of the other colors, so that when a piece has thoroughly dried out no further action takes place. Be it known that if the bichromate breaks up I doubt greatly whether there is any harmful oxide left. There are sufficient vegetable chemical derivatives present to completely satisfy any acid that may be liberated in a possible chemical change produced in the application of the chemical, to say nothing at all of the preservative value of the subsequent mode of finishing, filling, shellacing and varnishing. Even though we omit the varnishing, we give it sufficient finish to protect forever that small diminutive possible free acid or oxide that may be present by the use of the chromium salt. We all allow for a gradual darkening and mellowing of finish produced by age.

Before closing, let me say that the statement made that "where wood has been subjected to the elements and the outer finish entirely worn off, the wood therefore assumes a grayish color," does not concern the furniture manufacturer, or the finisher, for he knows if he is going to stain a door whether that door is going to be subjected to the elements or not. For if it is to be exterior work, he will protect the wood by the use of a varnish, such as spar varnish which has been manufactured for that purpose. I feel that I can consistently say to the manufacturer who has been employing a small amount of bichromate of potash, recommended by myself and many others, and now in general use in the finishing department, that in the amounts given there is absolutely no reason for any apprehension as to the permanency of results. It acts as a mordant to the aniline colors. Our mothers when dyeing carpet rugs used similar salts to set the colors. They didn't know why it set the colors, they were satisfied with knowing that it did the work, and they never borrowed trouble after they made their dyeing in that manner.

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

WOOD STAINS

Ready to Dissolve—Shade Always Correct

Write for Our New Price List—It's Free for the asking

The Book of "GASCO" Stain Products

Compiled by **Mr. Walter K. Schmidt,** *our Chemist*

and get into direct communication with the originator of these *"Ready to Dissolve" Dry Powder Stains.*

Get our samples of the later creations,—standard shades of Fumed Oak, Grey Oak, Grey Maple, "Brown Mahogany," Sheraton Mahogany, Jacobean oak, etc., etc.

Full direction for procedure with every order—permanent results.

Canadian prices made in consideration of Tariff.

Special—Our Oil Soluble Fumed Oak for quick work.

We will send you working sample.

Get our prices on Blacks, Reds, Yellows, Browns, Oranges, etc., etc. If you have a color to match—we do it.

German - American Stain Company
16 Monroe Avenue (*New Number*) Grand Rapids, Mich.

The Finishing of Carvings

By Ben C. Mortimer.

CARVINGS should never be finished with a gloss. The effect is much richer and more artistic, no matter whether the background is a satin finish or a high polish, if the carvings are perfectly dull. They must, of course, match the rest of the wood in color, but the more they have the appearance of not having been coated with anything, the better the effect.

On high-grade work, if the carvings are to be placed on a flat surface, such as a panel or anything of that nature, the carvings and panel should be finished separately and put together after they are finished. This makes a much more even and beautiful job than can possibly be done where the carvings are first put on the panel and both finished together.

Years ago, when carvings and panels were both varnished and finished up alike, the contention of those who wanted the carvings put on before finishing was that the brads required for putting on the carvings left a bad looking hole in the varnished surface. But whatever force may have been contained in the argument at that time is to-day lost in the fact that carvings should not be varnished. It is possible today to mix a putty to match any color of wood or stain, and if the brad holes are filled up with this it requires an expert eye to detect it. The wood being dull and the putty dull, they look alike.

Stain the carvings in the usual way to match the panel they are to be placed on. Fill or not, as desired; the writer prefers not to fill carvings. The effect is much more artistic when not filled, as the open pores give a touch of distinctiveness that enhances the beauty and which is destroyed by filling. When the stain is dry, put on a coat of very thin shellac. If a perfectly lusterless finish is desired it is important that the shellac be very thin—not more than 1½-lbs. of gum to the gallon of solvent, if the wood is not filled; if the wood is filled, 1-lb. to the gallon will be sufficient.

Sand this lightly with the finest sandpaper obtainable, then apply two or three coats of banana oil. This oil is not made from bananas, as one would understand from the name, but derives its name from the odor which it throws off, and which is like that of bananas. It is made from a by-product of the distillery, dries very rapidly, and is absolutely lusterless. Two or three coats may be put on in as many hours. The oil should, when the final coat is dry, be sanded lightly with fine paper, waxed with a very thin wax and wiped off thoroughly dry. This waxing is done to give a clearer and more finished effect after the sanding.

Banana oil should be put on very rapidly and with as little brushing as possible; just enough brushing to cover the surface is all that is required. If more than that is done on the second or succeeding coats it will raise the under coats. It will not lap or streak, therefore will not show up if not put on quite evenly. If too heavy to work properly it may be reduced with denatured alcohol or methylated spirits of alcohol. But it might not be well to use any substitutes for alcohol, such as wood alcohol or any of the various shellac reducers that are on the market. The great majority of these would create trouble with it at once. Denatured alcohol is grain alcohol to which has been added 3 per cent or more of benzine. It is well to have the alcohol as nearly pure as possible.—Woodworker.

"50"

FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and does not show brush marks.

R. C. Jamieson & Co., Ltd.

Established 1858

Montreal Vancouver

Owning and operating P. D. Dods & Co., Limited

OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

Oil Soluble Stain Powders

Try our latest and best production.
A perfectly Oil Soluble

Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Schmidt Walter K. Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

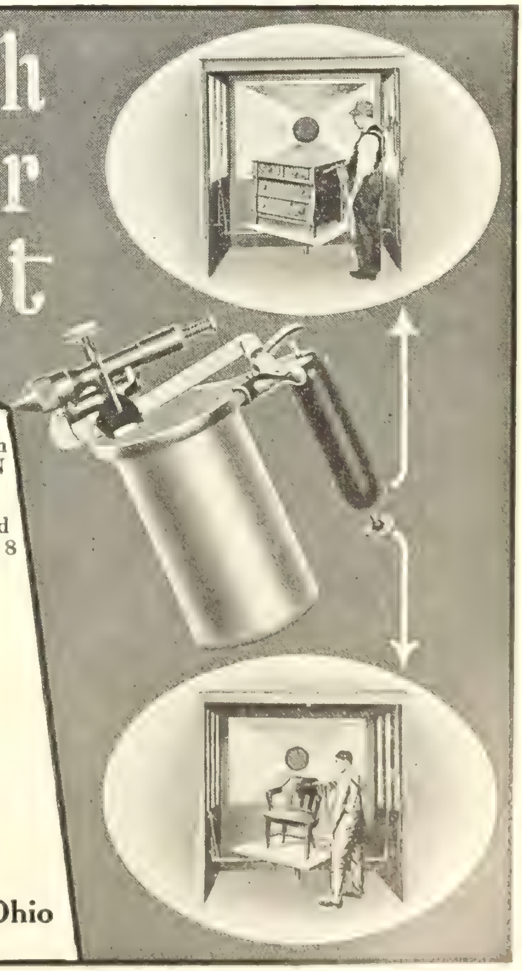
The Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

THE GLUE BOOK

WHAT IT CONTAINS

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
Nicholls Building, Toronto



A Better, Finer Finish at a Lower Cost

With the Aeron System
Guaranteed
Paints With Air

which applies first coaters, enamels and varnishes—thereby removing the inefficient, unsatisfactory hand brush from the finishing room, a smooth and uniform surface is always obtained. There are no brush marks, no thin spots, no sags, no runs and no fatty edges. Every article of furniture comes from your factory perfect in finish—a finish that cannot possibly be produced in any other way than with the AERON SYSTEM.

Along with this marked improvement in finish, there is a surprisingly big saving in time and labor. In AERONING, there is no lost motion, one man accomplishing as much as 2 to 8 with a brush—doing better work—effecting a saving of 25 to 90 per cent.

SIMPLE IN OPERATION The AERON will instantly and accurately respond to the operator's every inclination—will meet every requirement. No matter how irregular or rough the surface may be, or how difficult of access the places are, the AERON finishes smoothly and readily. The complete equipment and service is installed on a guaranteed basis.

PROVED RESULTS The AERON SYSTEM is used in hundreds of furniture finishing rooms, and is faithfully and successfully performing its every function. These manufacturers receive daily proof, in the form of savings and better work, of the merit, the economy, the efficiency of the AERON—our claims are based on these actual and regular performances of the machine.

A Post Card request from you will bring
AERON Catalog and AERON Detailed Information BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr Street, Toledo, Ohio

Veneers and Panels

The Manufacture of Flush Veneered Doors

Contributed by Leonard A. Blake.

FOLLOWING on a previous article regarding the practice of veneer work as it affects the manufacture of the ordinary veneered door, it will be timely to say a few words about the flush door, that is to say, the type of door that shows no panels or frame. The face of one door of this kind looks very much like the face of any other door of the same kind, but inspection of the ends is likely to reveal a considerable variation in the core construction, and it is with core construction that this article is dealing.

Given a mill with the requisite apparatus in the way of veneer jointers, glue spreaders, etc., and a sufficiently plentiful supply of core and crossbanding veneers, the cores for flush doors are best glued up as five-ply panels in the first instance, to be sanded and have the face veneers glued on afterwards. This method gives a strong door, in fact the strongest, since the core has fewer joints than when glued up from small pieces of solid lumber.

Besides the five-ply core there are two outstanding types of built-up core which differ considerably in the appearance of the ends of the finished door, as shown in Fig. 3. Door No. 1 is made very much like a panelled door in that it has rails tenoned into the stiles, but instead of an opening being left for the panel, the whole of the space between the stiles is filled up with cross rails, close jointed. The stiles and rails are first glued up separately, the stiles being provided with one hardwood edge. The rails are made as wide as may be most convenient, generally about 1-ft. Then the stiles are grooved and the rails tenoned and the whole door is dowelled and glued up, being finished perfectly smooth through the sander, ready for the face veneers.

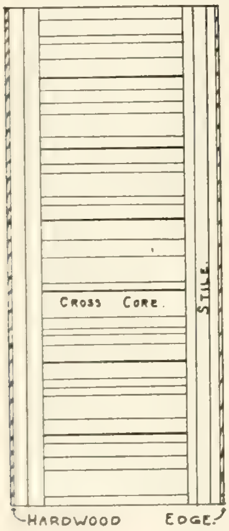


Fig. 1.—Door No. 1, cross cored.

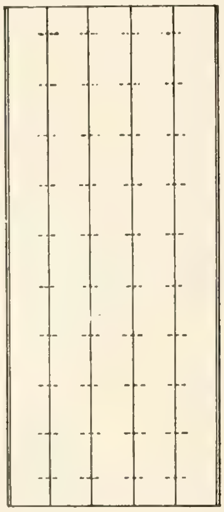


Fig. 2.—Door No. 2, straight cored.

With the usual thick veneer used for doors (⅛-in.) it is not necessary to use cross-banding if the core body has been properly made and finished.

Construction should not be attempted without crossbanding if the veneer is only 1/16-in., and the crossbanding should be applied separately from the face veneers. Crossbanded doors should be piled and stripped for eight or ten days before being sanded to receive the finish veneer. The drying room should have a temperature of from 80 to 90 degrees Fahr., and the doors should again be kept in it for ten days after face-veneering and before sanding.

Experience is the only guide to enable one successfully to arrange matters when it is necessary to use different kinds of veneer on each side of the door to match different kinds of finish. Different woods have different degrees of expansion, and it is impossible to lay down any definite rules for making one side properly counteract the other.

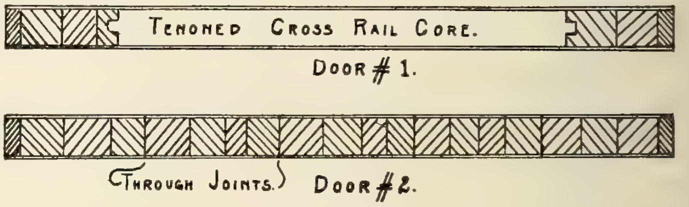


Fig. 3.—Section through doors.

Where the necessary means for pressing the veneer on a large door is lacking, the procedure is about the same as when getting up stock for veneered panel doors. The cores are got out in narrow widths like stiles, the actual width worked to depending on the width of veneer to be used. Hardwood edge strips are applied to those cores which have to go on the outside edge of the door. When all the cores have been assembled they are veneered and jointed carefully true and square for glue joints, and glued up with dowels at a spacing of 12-in. or so. With care in the matching of the veneer the door will have the very appearance of one that has been fully built up before veneering, and with careful jointing and drying it will give equal satisfaction.

All glue work should be done in a temperature ranging between 70 and 80 deg. F. The former temperature is high enough for the work and the proper use of the glue, while the latter temperature is too high in the winter time for the comfort of the men. A higher temperature, even, than 80 should be used for drying after the stock is veneered; but this should be in a room by itself, separate entirely from the workmen. It is certainly not safe to handle or spread glue in a temperature of 50-deg. It is certain to get chilled and much of its adhesive quality destroyed.

The electric motor will give you an exact knowledge of the power required to run your shavings fan, and often it will be found that if the motor is direct-connected there will be a power saving as compared to driving with a belt.

Why Some Veneered Goods are Bad*

THERE is still a great deal of veneering done in such a manner and under such conditions that a comparison with a modern veneer room would make the veneer man gray-headed trying to figure out how they ever do it and get away with it.

The writer had occasion recently to visit a furniture factory that, with the exception of the veneer department, was an up-to-date plant and in fine shape to produce furniture at a profit, being fully equipped with modern machinery, lots of room and conveniently arranged. But evidently their veneering was getting them "in bad," and I didn't wonder at it after seeing the outfit in operation.

The line manufactured consisted principally of case goods, with a small assortment of jardiniere stands, parlor tables, etc., to work up the cuttings. The veneering done was for the greater part gables, door panels and drawer fronts, and the means they employed to get the work through were amusing.

The veneer room equipment consisted of a glue pot, half a dozen wooden presses and a few aluminium cauls. The veneered gables were supposed to finish about 5/16-in. thick, and who the authority on veneering was around the place I could not decipher. They were making these gables four-ply, with a cross-banding on one side only. During my twenty years' experience with veneered work I never saw anything similar.

I was much interested and was mentally figuring on what the final results would be, when two husky chaps proceeded to unload the press, which evidently contained the last of the batch, for after depositing the contents on a truck, they hauled it around to a pile which proved to be the other portion of the batch that had been previously veneered, and was then being held down by about half a ton weight of planks and other material. These were removed and the gables piled on the truck with those just taken from the press and the whole batch went directly to the sander.

The sander man must surely have been expecting them, for he lost no time whatever in getting started on them, and in less than one hour after leaving the press they had all passed through the three-drum sander and were neatly piled on a truck, with several hundred pounds of planks on top of them. This procedure being somewhat out of the ordinary, I was a trifle curious to know the reason for it, and fully expected the next operation would be to pile them on strips to dry, but no such treatment appeared to be included in this particular process. Presently the cut-off man hauled the truck to his machine and all were cut to size, and directly after completing his work he replaced the weights on top of them. From there they lost very little time in reaching the shaper, where they were sized on edge to fit a groove.

I was sure that they would now be stacked on strips, but in this, as before, I was mistaken, for they were taken at once on the elevator to the cabinet room, being still held down by the weights. On arriving in this department they went directly to the belt sander, and the operator here, like the one down stairs, was evidently expecting them, for he proceeded at once to belt them, and as soon as he had finished the last one he carefully placed the weights on top of them.

I was puzzled to understand why so much sanding had been done on green stock, for a like amount on dry stock would produce a surface fit for any finish, whereas, in this case, they had the appearance of being sanded with a very coarse paper, the surface being a mass of fine fuzz. As the whole affair was a mystery to me, I determined to find out the whys and wherefores, so I "beat it" back to the veneer corner, which, by the way, we could hardly term a department, for it was out in the open shop.

Here I found the machine foreman, who was a genial sort of chap and knew his business so far as the machine work was concerned. This was his first position in a factory where veneer was used, his previous experience being entirely on solid work. In the course of our conversation he informed me that his authority did not extend so far as determining the process of veneering; his business was to attend to the machine work after the stock had left the press, it being a condition on accepting his present position that, owing to his lack of experience at veneering, that particular part of the business would receive attention from another source. He would be amply satisfying the requirements as a machine foreman if he could device a way to do the machine work after it was veneered, and, "Believe me," he remarked, "It is some job."

I inquired as to his reason for doing the machine work before the stock had been thoroughly dried, and he told me that this had been the cause of his predecessor's failure to make good; that he had insisted on piling the stock on strips to dry before working it, and, owing to its faulty construction, it was so terribly warped that he lost nearly half of it in the process of machining. The greatest difficulty was in the sanding. On the three-drum machine the corners of the gables would catch on the edge of the beds and tear the face veneer off, and any that escaped that misfortune would either be split or sanded through on the corners or edges, owing to being so badly warped.

I asked what the reason was for putting cross-banding on one side only, and intimated that that was the cause of the warping. He said he knew it was, but orders were orders, and they must adhere to them. He fully realized how useless it was to offer any suggestions along that line.

I asked what the object was in making the sanding the first operation, especially on green stock, as the surplus glue on the edges would soon fill the paper so that it would hardly cut at all, and, besides, would leave marks on the work that would be very hard to remove afterwards. Well, he said the reason for doing the sanding first was because that was the operation that usually played havoc with the stock, and by rushing it direct from the presses to the sander it was possible to get the sanding done without tearing the veneer off or sanding the corners through, while to perform the various other operations first resulted in disaster at the sander. The extent of the warping due to exposure to the atmosphere for even a limited length of time was surprising.

I was convinced by this time that I had accidentally run across the most peculiar process in regard to veneered work I had ever seen, so thought I would see for myself what the outcome of it was. I retraced my steps to the cabinet department, and, after noting the same treatment continued in regard to weighting down the panels, I inquired of the cabinet foreman when the process of drying took place. He smiled at my inquiry, and remarked that he guessed it was after the work was assembled.

"But how do you manage to keep them straight after they are assembled?" was my next query.

---

* By Max Millar in Veneers.

"Well," he said, "it is sometimes a difficult job, but the means we employ serve very well in most cases. When we put the gables together, we brad and glue the drawer guides to the gables, and when the cases are clamped up we glue-block the gables in the cross-rails or drawer bearers, and in this way the majority of them are kept comparatively straight."

"Do you not think that these gables ought to be thoroughly dry before they are put in the cases?" I then asked.

"Oh," he said, "undoubtedly," but the orders here are very explicit in that respect, and, besides, the construction won't permit of a thorough drying before working. They would be so crooked that we could never get them in the cases at all."

I then asked him if blisters were very prevalent, and told him I thought the sanding on the three-drum machine when the stock was green was very apt to heat the glue sufficiently to loosen the veneer in places. He informed me that when putting up cases it just about required one man steady, repairing, and the repairs were mostly blisters. During our further conversation he informed me that he was too busy in his own department to bother about the finisher foreman's troubles, so I wended my way to that department, and I found the finisher touching up gables.

This man had evidently had considerable experience on veneered goods, and expressed himself as being practically disgusted with the results he was getting. He said it was very common to have the goods go to the rubbing room and have to be returned to the coaters to have more varnish put on, and even with the extra labor and material a good percent of the work went out in an unsatisfactory condition, and that his stay was likely to be short unless matters improved, for he was surely losing his reputation as a finisher.

I examined a number of finished cases, and found that the results were about as I had anticipated when I noted the stock going direct from the press to the three-drum sander. This case is a fair sample of that which stands in the way of veneered products obtaining that exalted position they rightfully deserve.

Redrying Veneer Before Laying

NOT every shop has sufficient work to justify the expenditure necessary to install a redrier, and these shops are liable to overlook the importance of having veneer perfectly dry before being laid. In shops where there is a lot of work and a redrier it becomes a matter of habit to redry the veneer. It is done so quickly and with so little inconvenience that it dovetails itself in as a necessary part of the operation to such an extent that one would no more think of laying the veneer without first redrying than one would think of laying it without matching.

But there are still a lot of shops that neglect this very important part of the veneering process, either because they do not fully appreciate its importance or do not know how to do it without an expensive machine. Many who do know better will, if they are somewhat rushed, take a chance on laying the veneer without any pretense of drying.

The writer recently had occasion to visit a shop that was experiencing considerable trouble with veneered work. They had been having trouble for a long time, but lately it had become worse. Formerly they had kept the veneer stored in a storeroom adjoining the cabinet room, but this was thought to be too dry and it was thereafter kept in the basement. Then their troubles began in earnest. Formerly the trouble was with fine checks, but now the checks were large, and many of them opened right up.

The veneer man could not understand it. Of course, his idea was that when the veneer was kept in the storeroom it checked when it got dry, and it puzzled him greatly to find it checking even worse when kept in a moist place where it could not dry out. He also assured us that he had for some time been trying the experiment of putting fewer pieces in the press to prevent them swelling, but the results were the same.

In carrying out a system so many people fail because they do not carry it out in its entirety. So often some little thing is left undone that spoils the whole thing. Of what use is it to rush veneered stock into the press that the moisture from the glue may not swell it, when it has already been swelled almost to its fullest extent by being permitted to absorb moisture in a damp basement? Had this man started to hustle his stock into the press at the time that he was keeping his veneer in the dry storeroom, his trouble with checking would have been overcome.

It does not make any difference when or where the veneer takes up the moisture, whether it gathers it from a moist atmosphere in the basement, whether it is sponged to straighten it out or whether it gets it from the glue before it is put in the press, the effect is the same, and results in expansion. If veneer, at the time it is laid, has already expanded as a result of moisture obtained from other sources, it will not expand much more by coming in contact with the glue. It is dry veneer that expands, and it is this veneer that should be hustled into the press before it gets a chance to swell.

Don't be afraid to have your veneer good and dry. No danger of it being too dry. It may be easier to handle when moist and soft and pliable, but to lay it in that condition means no end of trouble in the future.

If you must keep the bulk of your veneer in the basement or some other place that is not very dry, you can keep your requirements for a few days ahead in some place where it can dry. Perhaps you have a drying room where you keep your veneered stock after taking from the press. Make a rack with arms from near the floor to the ceiling. Have these arms quite close together up and down, and not more than 2-ft. apart horizontally. Place the sheets of veneer across these arms singly, and, being very thin, they will soon dry out. If the drying room is well heated and ventilated and plenty of time can be given to dry, several sheets may be laid together on the arms. But if you are short of time, put them in singly.

Ordinary plain veneer seldom, if ever, requires any straightening out. It is the fancy figured stuff, with the grain of the wood running in every imaginable and conceivable direction, that buckles into so many shapes. This stuff must be straightened out before it can be laid, otherwise it will break into pieces like so much china when put under the press.

The factory of which I have been speaking had a large mahogany office desk, the drawers of which were veneered with crotch, but a worse lot of checks I have

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB Reg U.S. Pat. Off. **Hoffman Bros. Co.** HB Reg U.S. Pat. Off.

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS,

1/24 and 1/30 Slice Cut

(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers, Band Sawn Lumber.

—*SPECIALTY*—

HB Reg U.S. Pat. Off. **Indiana Quartered Oak** HB Reg U.S. Pat. Off.

Sawed Quartered Oak Veneers

WHITE OR RED — HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

never seen. The veneer man, when questioned as to how he did the work, said that the crotch veneer was very dry and badly buckled (it was done while they kept the veneer in the store room), and to keep it from smashing into fragments when under the press he had soaked it in water, then spread it out for the surplus to drain off, and laid it while yet soft and pliable.

Had the man taken these sheets of crotch, and, after allowing the water to drain off and while they were yet soft and pliable, placed them singly between boards of a soft, absorbent nature, and put them in the press for a while, this trouble would have been avoided. Boards for this purpose should be very absorbent and have every particle of moisture extracted from them. They should be heated just as hot as steam pipes can heat them, which means that the average man can't handle them with the bare hands. This is necessary in order to thoroughly extract in the quickest possible time all the moisture from the veneer. After a few hours it may be taken from the press, when it will be perfectly dry and straight and ready to lay.—W. H. Homier in Veneers.

Waste of Wood in Industries

EACH class of wood user is making use of material that formerly was considered waste. The manufacturers of planing mill products no longer burn shavings and sawdust merely to get rid of it, but sell it for bedding and packing, for refrigerator cars, etc.; while the larger slabs and other pieces go into laths or bundles of kindlings.

Spruce and hemlock slabs and edgings are sometimes sold to sulphite pulp manufacturers.

The general millwork establishments in cities utilize most of their short pieces and odd lengths in one way or another, even to the turning of small pieces of beech into wooden button forms, clear hardwood short pieces into novelties, mirror and brush backs, and small strips into mouldings.

Several minor industries now depend upon the waste from the major industries for part of their raw material.

Toy and novelty manufacturers frequently obtain their stock from the fixture, furniture and general millwork men; camera works obtain the small blocks from the manufacturers of billiard cues; manufacturers of small chair sleds and toy wagons use odds and ends from furniture establishments; while the producers of small mallets and handles obtain much stock from large vehicle establishments.

In describing his latest researches in the electrical seasoning of timber, Dr. Nodon claims that his process can be applied in the forest where the trees are felled, since no cumbrous or costly equipment is required. The process depends on the electrolysis of cellulose and its derivatives. The newly-felled trees are sawn into thick planks and laid on a false flooring, one on top of the other, with the interposition, however, of moistened matting or similar material between each layer, to act as electrodes for the introduction of alternating current which is passed for ten hours or so. The effect of the current is to produce chemical changes in the cellulose and the sap, rendering them impervious to decay. Further, the sap loses those gummy and hygroscopic characteristics which normally prevent rapid drying. It is claimed that timber thus treated is ready for use a few weeks after it is felled, and is harder, stronger, more homogeneous, easier to work and less warped by moisture than timber which has been seasoned by the ordinary air-drying process. Paving blocks treated by the Nodon process are said to have been in use at Bordeaux for six years without showing appreciable deterioration.

Technical Education at Calgary

IN the best interests of the woodworking trades it is necessary to keep abreast of what is being provided in the way of facilities for technical education throughout the country, and with this end in view the Canadian Woodworker has been in communication with various authorities. Not long since a report was received as to what was being accomplished in Western Canada, particularly at Calgary, which has a reputation for having taken enterprising measures in this field. At our request, for the information of Woodworker readers, Mr. T. B. Kidner, Director of Technical Education at Calgary, furnishes in the following communication a number of details concerning the work in hand.

Editor, Canadian Woodworker:

I may say that here at Calgary, technical education is a subject which is receiving greatly increased recognition. During the last three winters we have carried on a class in drawing for house carpenters, which has proved most useful. This course is almost entirely individual, as in our experience no two students seem to want quite the same training. The work has varied from simple mechanical drawing at the beginning to the planning of houses of moderate price suitable for erection on the ordinary city lots. Two evenings a week are devoted to this subject for about five and a half months during the winter, and the pupils vary from beginners to leaders and foremen. At present we have no shop instruction in trade classes, but our manual training rooms are open for those who wish to get a little elementary training in woodwork. No attempt is made at trade teaching in these classes.

We are looking forward to the establishment of a large Vocational High School in which there will be ample provision for shop instruction. From a somewhat long experience I am of the opinion, however, that it is wiser for evening classes to attempt merely to supplement the training workmen obtain by the actual practice of their trade in the day-time, and therefore the evening school shop work would be largely confined to instruction and practice in the higher branches of the trade, such as stair-casing, handrailing, steel square practice, work of double curvature and the setting out of all kinds of high grade interior and constructional woodwork. As a preliminary to the class in drawing for house carpenters, we have large classes in mechanical drawing, in which a number of general courses are given—the idea being that the course shall serve as a preliminary alike for the woodworking, sheet metal working, machinist, electrical and building trades. The course, therefore, is planned to include simple plane geometry, a little solid geometry and projection, and a number of practical examples of surface development, simple details of buildings and machinery and practice in lettering and dimensioning.

In building construction we have an elementary and an advanced course, and in each of these considerable attention is given to woodwork details. In the advanced course last winter a series of talks was given on estimating and the students took out the quantities in all trades for two or three typical buildings. We provided each student with a blue-print and specification, and the instructor, who was an estimator for a local firm of contractors, went through each step on the blue-print and the student made the necessary

(Continued on page 56)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Stock on Hand for Immediate Shipment

1/40-in. Slice Cut Quartered White Oak.
1/28-in. Slice Cut Quartered White Oak.
1/20-in. Slice Cut Quartered White Oak.
1/16-in. Slice Cut Quartered White Oak.
1/20-in. Veneer Sawed Quartered White Oak.
1/16-in. Veneer Sawed Quartered White Oak.
1/8-in. Veneer Sawed Quartered White Oak.
3/16-in. Veneer Sawed Quartered White Oak.
1/4-in. Veneer Sawed Quartered White Oak.
1/20-in. Veneer Sawed Quartered Red Oak.
1 16-in. Veneer Sawed Quartered Red Oak.
1/8-in. Veneer Sawed Quartered Red Oak.
3/16-in. Veneer Sawed Quartered Red Oak.
1/4-in. Veneer Sawed Quartered Red Oak.
1/28-in. Rotary Cut Plain Oak.
1/20-in. Rotary Cut Plain Oak.
1/16-in. Rotary Cut Plain Oak.
1/8-in. Rotary Cut Plain Oak.
1/8-in. Veneer Sawed Plain Oak.
3/16-in. Veneer Sawed Plain Oak.
1/4-in. Veneer Sawed Plain Oak.
1/28-in. Slice Cut Figured and Plain Mahogany.
1 20-in. Slice Cut Figured and Plain Mahogany.
1/16-in. Slice Cut Figured and Plain Mahogany.
1/8-in. Slice Cut Figured and Plain Mahogany.
1/20-in. Veneer Sawed Figured Mahogany.
1/16-in. Veneer Sawed Figured Mahogany.
1/8-in. Veneer Sawed Figured Mahogany.
3/16-in. Veneer Sawed Figured Mahogany.
1/4-in. Veneer Sawed Figured Mahogany.
1/20-in. Veneer Sawed Plain Mahogany.
1/16-in. Veneer Sawed Plain Mahogany.
1/8-in. Veneer Sawed Plain Mahogany.
3/16-in. Veneer Sawed Plain Mahogany.
1/4-in. Veneer Sawed Plain Mahogany.
1-in. to 4-in. Sawed Mahogany.
Slice Cut Crotch Mahogany.
Veneer Sawed Crotch Mahogany.
1/28-in. Cut Circassion Walnut, Sawed 1/8-in.
Cut Circassion Walnut, Sawed 3/16-in.
Cut Circassion Walnut, Sawed 1/4-in.
Cut Circassion Walnut, Sawed 1-in. and thicker.
Cut Figured Walnut.
1/28-in. Rotary Cut Plain Walnut.
1/20-in. Rotary Cut Plain Walnut.
1/16-in. Rotary Cut Plain Walnut.
1/8-in. Rotary Cut Plain Walnut.
1/8-in. Veneer Sawed Plain Walnut.
Rotary Cut Bird's Eye Maple.
1/8-in. Sawed Bird's Eye Maple.
3/16-in. Sawed Bird's Eye Maple.
1/4-in. Sawed Bird's Eye Maple.
1-in. and thicker Bird's Eye Maple.
1/28-in. Rotary Cut Curly Maple.
1/8-in. Sawed Curly Maple.
Curly Maple 1-in. and thicker.
1/28-in. Rotary Cut Plain Birch.
1/20-in. Rotary Cut Plain Birch.
1/16-in. Rotary Cut Plain Birch.
1/8-in. Rotary Cut Plain Birch.
3/16-in. Rotary Cut Plain Birch.
1/4-in. Rotary Cut Plain Birch.
Cut Hungarian or Figured Ash.
1/28-in. Rotary Cut Plain Ash.
1/20-in. Rotary Cut Plain Ash.
1/16-in. Rotary Cut Plain Ash.
1/8-in. Rotary Cut Plain Ash.
1/20-in. Veneer Sawed Plain Ash.
1/16-in. Veneer Sawed Plain Ash.
1/8-in. Veneer Sawed Plain Ash.
3/16-in. Veneer Sawed Plain Ash.
1/28-in. Rotary Cut Poplar.
1/20-in. Rotary Cut Poplar.
1/16-in. Rotary Cut Poplar.
1/8-in. Rotary Cut Poplar.
3/16-in. Rotary Cut Poplar.
1/4-in. Rotary Cut Poplar.
1/8-in. Veneer Sawed Poplar.
1/28-in. Rotary Cut Gum.
1/20-in. Rotary Cut Gum.
1/16-in. Rotary Cut Gum.
1/8-in. Rotary Cut Gum.
3/16-in. Rotary Cut Gum.
1/4-in. Rotary Cut Gum.
1/20-in. Rotary Cut Yellow Pine.
1/16-in. Rotary Cut Yellow Pine.
1/8-in. Rotary Cut Yellow Pine.
3/16-in. Rotary Cut Yellow Pine.
1/4-in. Rotary Cut Yellow Pine.
1/28-in. Sliced Cut Red Cedar.
Red Cedar, 1-in. and thicker.

Also Rosewood, Cherry, Maple, Chestnut, etc.

WIRE OR WRITE FOR PRICES

Acme Veneer and Lumber Company, Cincinnati, Ohio

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

WRITE US FOR PRICES

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

Producers and Manufacturers

MAHOGANY Mexican, Cuba, African

CIRCASSIAN WALNUT (Poti Wood)

East India Mahogany (Andaman Islands)

San Domingo (Direct Importation)

All Imported Woods in

LUMBER and VENEERS

Request our District Salesman to call upon you with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,
Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati ⁃ ⁃ ⁃ ⁃ **Ohio**

Write for a quotation on this space—it will put you in touch with veneer manufacturers.

Goshen Veneer Co.
GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for
Poplar and Red Gum Veneers and Crossbanding

CIRCASSIAN WALNUT VENEER

Lot No. 1, 9 flitches, 16000-ft., average value 4 cts. per foot.
Lot No. 2, 13 flitches, 23100-ft, average value 2 cts. per foot.

A DISCOUNT OF THIRTY PER CENT

Offered First Cash Buyer.

HUDDLESTON-MARSH LUMBER CO.,
2260 Lumber Street
CHICAGO, Ill.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT

LUMBER AND VENEERS

American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:

BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM

Quartered

3 cars	4/4,	1's and 2's
2 "	5/4	"
1 car	6/4	"
1 "	8/4	"
3 cars	4/4	No. 1 Com.
1 car	5/4	"
1 '	6/4	"
1 "	8/4	"
1 "	10/4	"

RED GUM

Plain

4 cars	4/4,	1's and 2's
2 "	5/4	"
1 car	6/4	"
1 "	8/4	"
1 "	10/4	"
2 cars	4/4	No. 1 Com.
1 car	5/4	"
1 "	6/4	"
1 "	8/4	"
1 "	10/4	"

THE FAMOUS CACHE RIVER GUM

Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

Rotary Cut Veneers

For the Furniture Trade

We produce our own Stock

Being advantageously located in the midst of the great timber section of North Carolina, we are in position to satisfactorily supply the needs of the furniture trade.

"Quality and Service" is our motto.

Write us for prices

Carolina Veneer Company

JOSEPH E. KOCHA, President

BILTMORE, NORTH CAROLINA

The Glue Book

What It Contains:

Chapter 1—Historical Notes
Chapter 2—Manufacture of Glue
Chapter 3—Testing and Grading
Chapter 4—Methods in the Glue Room
Chapter 5—Glue Room Equipment
Chapter 6—Selection of Glue

Price 50 Cents

Woodworker Publishing Co.
Limited
Nicholls Building, Toronto

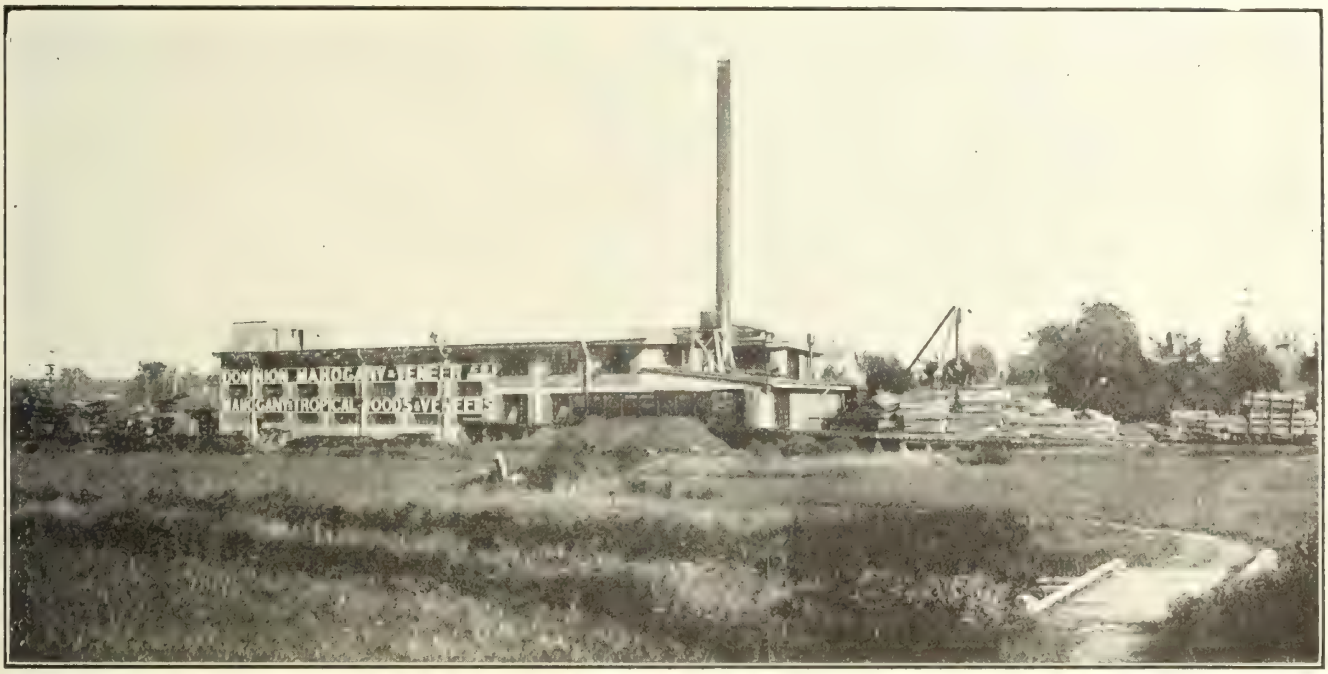
OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Dominion Mahogany & Veneer Co., Limited

MONTREAL WEST, QUE.



Veneers in Stock—Ready for Prompt Shipment

Sliced African Mahogany, 1/24, 1/20, 1/16, Plain and Figured.
Sawed African Mahogany, 1/24, 1/20, 1/16, ⅛, 3/16 and ¼, Plain and Figured.
Sliced Mexican Mahogany, 1/24, 1/20, 1/16, Plain and Figured.
Sawed Mexican Mahogany, 1/24, 1/20, 1/16, 1/18, 3/16, ¼, Plain and Figured.
Sawn Cuban Veneer, 1/20, 1/16, selected stock.
English Oak Veneers, 1/16 sawn.
Curly Birch 1/24 Sliced, Figured.
Circassian Walnut, 1/24, samples sent on request.
French Walnut, 1/24, samples sent on request.
Italian Walnut, 1/24, samples sent on request.
American Walnut, 1/20, samples sent on request.
Prima Vira Mahogany, 1/24, samples sent on request.
American Quartered White Oak, Sawed, 1/20, 1/16, ⅛, 3/16, ¼, selected for figure.
American Plain Sawed Oak, 3/16, ¼.
R. C. Red Oak, 1/16, ⅛.
R. C. White Oak, 1/16, ⅛.
R. C. W. Ash, 1/16, ⅛.
R. C. Brown Ash, 1/16, ⅛.
R. C. Poplar, 1/24, 1/20, 1/16, ⅛, 3/16. ¼.
R. C. Birch, 1/24, 1/16, ⅛, 3/16, ¼.
Sawed Yellow Poplar, ⅛, 10 in. and up wide.
R. C. Chestnut, ⅛.
R. C. Pine, ⅛.
R. C. Maple, 1/28, 1/20, 1/16, ⅛, ¾, ¼.
African Mahogany Lumber in all thicknesses at right prices.
Mexican Mahogany Lumber in all thicknesses at right prices.
Cuban Mahogany Lumber in all thicknesses at right prices.
Teak Lumber in all thicknesses at right prices.
Vermillion Lumber in all thicknesses at right prices.
Black Bean Lumber in all thicknesses at right prices.
Satinwood Lumber in all thicknesses at right prices.
English Oak Lumber in all thicknesses at right prices.
Spanish Cedar Lumber in all thicknesses at right prices.
Maple Lumber in all thicknesses at right prices.
Special.—About 1 car of 1-in. hard White Maple, good for flooring, and 1 car of 5/4 Birch and Maple No. 1 Common and Better

Send us your enquiries and we will cheerfully quote.
Let us figure on this year's contracts.

Technical Education at Calgary

(Continued from page 50)

calculations. We found this an exceedingly useful course and one much appreciated by the students.

The Board has in contemplation in the future the provision of such equipment in the Vocational High School as will allow of part-time classes in the day-time for youths in the building and other trades. When these classes are available we shall be able to offer much stronger courses. We are already assured of the co-operation of the employers and the Trades and Labor Council.

The Calgary School Board provides manual training in woodwork for all its school pupils, but this work bears no relation to trade teaching. It is given to all pupils alike, irrespective of their plans for the future. We have also in existence here a school of the new type known as Pre-Vocational, in which about half the time of the pupils is devoted to industrial work, the boys taking mechanical and freehand drawing work in wood and printing, and the girls taking sewing, cookery, laundry work and general housewifery and a course in freehand drawing similar to that given the boys. The pupils are selected from the groups of the elementary classes and the majority of them do not contemplate going forward to a high school course. It is anticipated, however, that our experience will be similar to that of other cities and countries which have taken up this form of school work and that a great many pupils will be induced to continue their education and enter the Vocational High School; or, in the case of their having to go to work at the earliest legal age, they will be more than likely to return to continuation or part-time schools when such are available."

It is of interest to note that Mr. W. B. Crawford has been given the management of a branch which has been established at Toronto by the Invincible Blow Pipe Company, Chicago. The latter firm has found it necessary to make a large addition to its capital stock in order to accommodate its growing business and provide the additional facilities rendered necessary by the expansion. The establishment of a Canadian branch follows a gratifying increase of business in this field of late. The new branch will be incorporated under the same style and title as the parent concern, and it is fair to assume that under the able direction of Mr. Crawford, who is a gentleman of wide experience, it will meet with outstanding success. The shavings and dust collecting system made and installed by the company has been adopted widely and is now in operation in hundreds of woodworking plants.

It is with great regret that we have to record the death of Mr. William Seiber, president of the Central Veneer Company, Huntington, West Virginia, which occurred at Huntington on the 12th inst. Throughout his life the late Mr. Seiber was actuated by the principle of furnishing the best goods under all conditions, and he was so successful that at the time of his death he was the head of the largest poplar cross-banding mill in the world. He was a man of unswerving integrity, and his loss will be mourned by all who have done business with him. It is safe to assume that those upon whom the responsibility of conducting the plant now falls will perpetuate the memory of the late Mr. Seiber by continuing along the business lines which he laid down.

Mr. H. N. Saxton, Jr., the well-known hardwood exporter, of Knoxville, Tenn., and formerly president of the Knoxville Sawmill Company (whose plant was destroyed by fire last January) has become associated with the G. H. Evans Lumber Company, hardwood exporters of Chattanooga, Tenn., and will be in a position to provide the same carefully graded hardwood as formerly under the old brands.

Woodworking News

From Coast to Coast

Fred Demers & Cie, will build a sash and door factory in Montreal.

Baldwin Pianos Limited, of St. Thomas, Ont., have obtained a charter.

Messrs. Durocher & Chatillon, furniture dealers, Montreal, have dissolved partnership.

J. H. Langevin & Cie., who operated a sash and door factory in Montreal, have dissolved.

The Briggs Planing Mill, Brockville, Ont., has been burned down and a loss of about $20,000 sustained.

Regina Sash & Door Company, Limited, Regina, Sask., have been organized with a capital stock of $20,000.

The Standard Furniture, Limited, has been incorporated with a capital of $50,000 and head office at Vancouver.

At Outlook, Sask., a furniture store has been opened up by the Ideal Furniture Company, Limited, Vancouver.

The American Woodworking Machinery Company have obtained a license to sell woodworking machinery in Ontario.

The Sprague Lumber Company, Limited, has been incorporated with head office at Winnipeg, and a capitalization of $2,000,000.

Good progress is being made in the construction of a $7,000 sash and door factory at Walkerton, Ont., for R. Truax & Son.

Moore & Whittington, planing mill, etc., have been incorporated as E. W. Whittington Lumber Company, Limited, Victoria, B.C.

The Uxbridge (Ont.) Piano Company, Limited, have been organized with a capital stock of $300,000. A plant will be erected at Uxbridge.

The Hermitage Club, Edge Block, London, Ont., is contemplating the purchase of a quantity of club furniture. Mr. Roy Garrett is the president.

Standard Furniture, Limited, is a new company recently incorporated, with headquarters at Vancouver, B.C. The company is capitalized at $50,000.

The Berlin Interior Hardwood Company are erecting an addition to their office and showrooms. The new wing will be used largely for display purposes.

Plans are drawn but tenders have not yet been called for the erection of a planing mill at Davisville, Ont., for R. W. E. Burnaby, 45 Adelaide Street East, Toronto.

At Orillia, Ont., a woodworking factory will be built by J. R. Eaton & Sons, Limited, at a cost of $100,000. The company will probably seek a loan of $50,000 from the ratepayers of the town.

The entire stock of the W. J. McLean Furniture Company's store in Souris, Man., is reported to have been destroyed through a fire which broke out in an adjoining building on June 27.

It is stated that the Adams Furniture Company, Toronto, are contemplating the erection of a new building on Yonge Street, Toronto, at an estimated cost of between $300,000 and $400,000.

At Cartierville, Que., the sash and door factory owned by Jasmin & Cantin was destroyed by fire recently, the loss being estimated at about $20,000. The plant was insured to the extent of $5,000.

The Oakville (Ont.) Basket & Veneer Company, Limited, have been incorporated with a capital of $100,000. The provisional directors are Messrs. J. M. Bullen, F. H. Hurley and R. G. Agnew.

At Grimsby, Ont., the plant, which consisted of new machinery, of the Consumers' Lumber & Box Company, was burned down recently, involving a loss of $25,000. The insurance was only $12,000.

The Canada Last Company, 5 Van Horne Street, Toronto, requires shaving machines, saw tables, boring machines and lathes for the equipment of their new factory. Tenders will be received by the manager, Mr. J. C. Iriedale.

The Western Broom Company are contemplating the erection of a broom factory at Regina, Sask., at an estimated outlay of $15,000. Mr. A. T. Kraehling and Mr. A. E. Thomas of Western Woodenware Company, 34 Scott Building, Winnipeg, are interested in the project.

Announcement is made of the incorporation of the Ideal Furniture Company, Limited, with a capital of $20,000.. The head office of the company is at Vancouver, B.C., and the firm will carry on business as cabinet makers, upholsterers, and wholesale and retail dealers in household furniture.

Fairview Manufacturing Company's sash and door factory, 6th Avenue West, Vancouver, was totally destroyed by fire recently. The factory, machinery and building were estimated to total in value $11,000, and the stock $10,000, whereas the insurance of the factory and contents was only $13,000.

The South America Cabinet Woods, Limited, which was incorporated recently with a capital of one million dollars, and whose head office is at Toronto, has acquired 47,407 acres of mahogany and cedar lands in Dutch Guiana. The company will probably erect a large veneering plant at some lake point in Ontario, possibly Oshawa.

A new company has been registered as the Burnaby lumber Company, Limited, with head office at Toronto, and a capital of $40,000, to carry on business as general lumber merchants, builders, contractors and manufacturers. The provisional directors are Ralph Waldo, Emmerson Burnaby, Norman Sommerville and Harry Allen Newman.

The Canada Pole & Shaft Company, Limited, has been incorporated with head office at St. Catharines, Ont., with a capital of $400,000. The business of the company will be to manufacture poles, shafts, vehicles, etc. The provisional directors are John S. Campbell, Vernon Moyer, Meta M. Harris, Laura A. Brown and Harold M. Campbell.

The incorporation is announced of "La Compagnie Industrielle d'Alfred Ontario Limitee," with a capital of $100,000, for the manufacturing of doors, windows and everything relating to the construction of buildings. The company will also carry on the manufacture of furniture. The chief place of business will be the Parish of Alfred, Ont.

The stove and implement factory of A. Belanger, of Montmagny, Que., was acquired recently by a strong syndicate, of which Mr. J. H. Fortier is the head. It is the intention of the new owners to continue the business as heretofore. The town of Montmagny is stated to be in favor of subsidizing any increase in the plant, and it is thought that a number of new lines will be added later on.

Unlike trade conditions in other portions of Canada business in the woodworking industries is reported to be well up to the normal in the Maritime Provinces with the exception of a few industrial centres. The T. R. Simms Company, Limited, whose model brush-making factory at St. John, N.B., represents the last word in the manufacture of brushes, are looking forward to an early improvement in western conditions and expect to be fairly busy at their plant during the next few months.

In connection with industrial expansion in St. John, N.B., the woodworking firm of Christie & Company have decided to enlarge their factory premises at Courtenay Bay, instead of rebuilding their fire-damaged plant on City Road.

Buy Direct
From the Manufacturer
We are their Salesmen

The
Saw Mill Owners
Sales Co.
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston, New York, Watertown, Montreal, Quebec, Toronto

Ash
B.C. Doors
Birch
Basswood
Beech
Cherry
Cedar
Chestnut
Cottonwood
Elm
Fir Finish
Hickory
Hemlock
Maple
N.C. Pine
Oak
Poplar
Red Gum
Red Pine
Sap Gum
Spruce
Sycamore
Shingles
Tamarac
Timbers
Walnut
White Pine
Yellow Pine

We Solicit Your Inquiries

PATENTS
Herbert J. S. Dennison, Patent Attorney and Expert
Patents, Trade Marks, Designs and Copyrights obtained in all countries
18 years experience in Patents and Practical Engineering.
Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% PROFIT SHARING
Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to
National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

OVER 65 YEARS' EXPERIENCE
PATENTS
TRADE MARKS
DESIGNS
COPYRIGHTS &C.
Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.
Patents taken through Munn & Co. receive *special notice*, without charge, in the
Scientific American.
A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.
MUNN & Co. 363 Broadway, New York
Branch Office, 625 F St., Washington, D. C.

1913 Edition
"Practical Pattern Making"
A Practical Work on
The Art of Making Patterns, written by a patternmaker with thirty years' experience. Contains information on Pattern Making and Pattern-Makers in general, also a detailed description of the necessary materials and how to use them. Then the tools, both hand tools and machine tools, with special chapters on the Lathes, the Band Saw and the Circular Saw, with many examples of work which may be done on these machines.
A complete section of illustrated examples of Pattern-Work in wood, with many pages of metal pattern-work, Gating and Plate work. Both Vibrator and Stripping Plates are shown. Specific instructions for plaster work are given, and finally, the cost, marking and record of patterns are explained and illustrated.
By F. W. BARROWS
Price $2.00
CANADIAN WOODWORKER
Nicholls Building, TORONTO

They think that better business results can be obtained from concentrating their energies at one location than by operating two plants. This decision on their part will result in the placing of two good industrial sites, with railway trackage, on the market. On one of these sites there is a 200 h.p. power plant available.

Canada Machinery Corporation, Limited

In connection with new financing recently carried out by the company whereby $150,000 additional working capital was provided by the shareholders, certain changes in the management have taken place through the retirement of Mr. T. F. Kenny as General Manager. In future Mr. T. H. Watson, the newly elected President, will assume these duties and take an active part in directing the company's affairs.

The contract for practically the whole of the school apparatus required by the Board of Education at Toronto was awarded to the A. R. Williams Machinery Company, Limited, of 64 Front Street West, Toronto, and not to the American Woodworking Machinery Company, as reported in our last issue. The equipment supplied by the above firm comprises three lathes with motor, one band saw, one jointer, one bench wood trimmer, drilling machine and wood turning tools.

A loose-leaf catalogue received from the Preston Woodworking Machinery Company, Limited, Preston, contains detailed descriptions, illustrated by excellent half-tones, of the machinery manufactured by this firm. The lines featured comprise No. 129 power feed rip saw, No. 130 power feed rip saw, No. 127 variety saw, No. 132 36-in. band saw, No. 125 tilting top saw table, No. 145 heavy 4-side moulder on base, No. 123 single surface planer, No. 121 pony planer, No. 143 buzz planer. No. 157 "Hodd" patented universal belt sander, No. 140 portable furniture clamp, No. 150 post boring machine.

Messrs. Huther Brothers Saw Manufacturing Company, Rochester, N.Y., manufacturers of circular saws, have issued in their Catalogue No. 34 a well-illustrated descriptive booklet on their products which cannot fail to be of interest to progressive woodworkers. The high grade of this company's products are recognized in the trade—so much so that Huther saws have become synonymous with efficiency and service. These saws are made of specially tempered steel and retain a good cutting edge. The many additional lines embrace much that is new and improved in design and manufacture. The company manufacture an extensive line of sheet steel novelties and furnish estimates required on all such work.

For Sale
Exhaust fan, dust collecting outfit; also furniture polishing machine.
LUCAS & SON,
7-8 Bridgeport, Conn.

Woodworking Foreman
Thoroughly posted on the making of desks. Permanent position and good salary to the right man. Address Box 37,
CANADIAN WOODWORKER,
7 Toronto.

PATENTS
STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) TORONTO, CAN.
The business of Manufacturers and Inventros who wish their Patents systematically taken care of is particularly solicited.

B. C. Fir Timbers
and
Clear Finish Stock
Kiln Dried or Air Dried
Red Cedar Shingles
Write or Wire
W. G. Scrim Lumber Co.
Vancouver, B.C.

Canadian
Hard and Soft Woods
Carefully Selected Stocks Carried
Your Enquiries Solicited
C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

The Atlantic Lumber Co.

Manufacturers and
Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

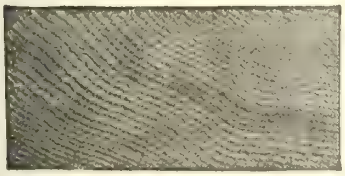
110 Manning Chambers - TORONTO
Phone Main 6386
HOME OFFICE, BOSTON, MASS.
Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Steven & Jarvis Lumber Co.
OF
Eau Claire, Wisconsin

Offer You Standard Grades
Well Manufactured

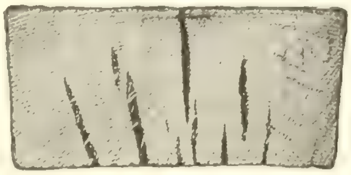
Ash
Rock & Soft Elm
Hard & Soft Maple
Birch
Basswood

Stocks cut 4/4, 5/4, 6/4, 8/4, 10/4, 12/4.
Write us for prices delivered your station.



Every kind and form
of
DRYING LUMBER

Grand Rapids
Dry Kiln
QUALITY DRYING
Grand Rapids
Mich. - U. S. A.



Plain Sawed Oak
Mills in West Virginia and Kentucky
Wilcox & Knapp
Conneautville, Pa.
Quotations Cheerfully Furnished

Stewart-Greer
Lumber Company

Band Mills
Mangham, La.

General Offices
St. Louis, Mo.

We ship direct from our own mills. All of our stock is **BAND SAWN**, cut from large Virgin Timber and well manufactured. We are in position to make immediate shipment of the following dry lumber:—

Quartered White Oak
2 cars 4/4 No. 1 Common.
2 cars 4/4 No. 2 Common.

Plain White Oak
10 cars 4/4 1st and 2nd.
10 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

Plain Red Oak
10 cars 4/4 1st and 2nd.
10 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

Red Gum
15 cars 4/4 1st and 2nd
10 cars 4/4 No. 1 Com.

Sap Gum
15 cars 4/4 1st and 2nd.
10 cars 4/4 No. 1 Com.
8 cars 4/4 No. 2 Com.

Planking
25 cars 8/4 White Oak Bridge
15 cars 8/4 Red Oak Bridge.
6 cars 3½ x 10 Crossing.
1 car 3-in. Crossing.

Yellow Pine, Short Leaf
12 cars 4/4 No. 1 Com. Rough.
25 cars 4/4 No. 2 Com. Rough.

Miscellaneous
4 cars 6/4 Log Run Elm
4 cars 4/4 Log Run Sycamore.
1 car 4/4 Log Run Ash.

Archer Lumber Company

HARDWOOD LUMBER

Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards 28718
4/4 18 in. and up Panel 33905

Profit in Window Frames

Machine does all the work shown in above cut.

May be secured in any planing mill by installing a

Perfect Window Frame Machine

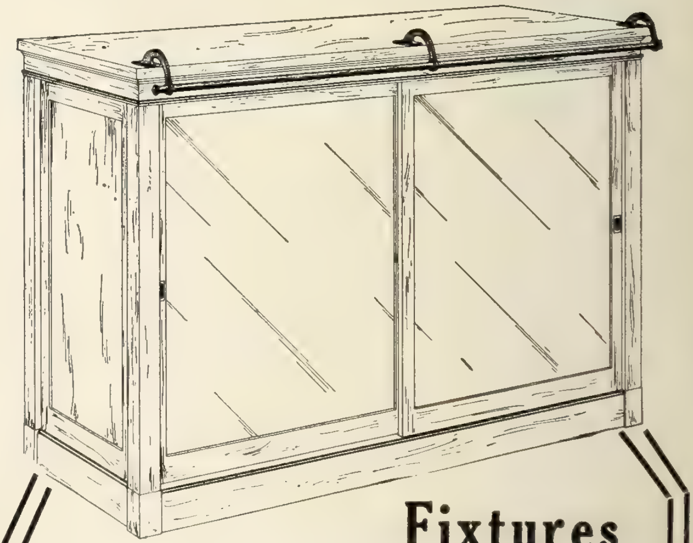
The old method of making window frames by hand is comparatively expensive.
Our new machine so reduces the cost of making that a mill equipped with one can easily underbid any "hand-made" competitor and still make a handsome profit.

Send for our catalog.

Smith & Phillips Mfg. Co.

412-422 N. Sangamon Street, CHICAGO, ILL.

Better ask for particulars of our Stair Router, Edge Jointer, Sash Groover and Light Shaper, an ingenious and effective tool.



Fixtures

We make a complete line of Cloak and Suit Case Fixtures. Our latest catalogue fully describes the Show Case Fixtures you are looking for. Send for a copy—it will save you money.

REFLECTOR & HARDWARE SPECIALTY MFG. CO.

Western Ave. at 22nd Place
Chicago, Ill.

INDIANA HARDWOODS

Young & Cutsinger

Manufacturers and Wholesale Dealers

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The

Powell-Myers Lumber Co.

South Bend, Ind.

Anything and Everything in

Hardwoods

cut to your order

OUR SPECIALTIES

Oak, Ash, Hickory, and Poplar Dimension

Red and White Oak Car Stock

White Oak Timbers, White Oak Bridge Plank

Oak Reaches, Oak Poles

Chair, Table and Implement Stock

Oak Bending Plank

SEND US YOUR ENQUIRIES

OAK

Quality First Brand

GUM

Licking River Lumber Co.

114 Lumber Street

SOUTH BEND, INDIANA

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker." They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY

Cincinnati, Ohio

OAK

5 cars 4 4 No. 1 and No. 2 Common Plain

DIMENSION STOCK

We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT

4 cars 4/4 Sound Wormy

BASSWOOD

2 cars 4/4 Log Run

YELLOW PINE

5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller
Lumber & Veneer Co.

CINCINNATI -:- OHIO

Manufacturers of

Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.

CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR

Extra Wide 1, 2, 3 and 4 inch 5/8" PANEL STOCK
6" x 6," 7" x 7" and 8" x 8" Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati, O.

ARE YOU WISE

To the fact that we carry on hand at all times 25,000,000 ft. of dry lumber; Poplar, Oak, both Plain and Quartered, Ash, Chestnut and Basswood, and that it comes from our own timber? Try a car of our Plain or Quartered Oak. There is **nothing like it**, for uniformity of color and texture.

The Mowbray & Robinson, Company

MILLS: Quicksand, Ky.
West Irvine, Ky.
Viper, Ky.

Main Office
Cincinnati, Ohio

YARDS: Cincinnati, O.
Detroit, Mich.
Rochester, N. Y.
Brooklyn, N. Y.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO

—We make a specialty of—

Mills:
Kentucky Tennessee
W. Virginia

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chesnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Immediate Shipment

West Virginia Stock

Thoroughly Dry and Well Manufactured

1 car 4/4 firsts and seconds, Plain White Oak.
2 cars 4/4 No. 1 Common, Plain White Oak.
5 cars 4/4 No. 2 Common, Plain White Oak.
1 car 4/4 No. 1 Com. and Bet., Plain White Oak, Worm holes no defect.
2 cars 6/4 No. 1 Common, Plain White Oak.
1 car 5/4 1s and 2s Plain White Oak.
3 cars 4/4 Sound Wormy Chestnut.
1 car 5/4 Sound Wormy Chestnut.
2 cars 6/4 Sound Wormy Chestnut.
2 cars 8/4 Sound Wormy Chestnut.
2 cars 4/4 No. 1 Common and Better Chestnut.
1 car 6/4 No. 1 Common and Better Chestnut.
1 car 8/4 No. 1 Common and Better Chestnut.
4 cars 4/4 No. 2 Common and Better Poplar.
1 car 5/4 No. 2 Common and Better Poplar.
4 cars 6/4 No. 2 Common and Better Poplar.
1 car 8/4 No. 2 Common and Better Poplar.
1 car 4/4 No. 2 Common and Better Walnut.

Write at once for Quotations. **The Price is Right.**

The Imperial Lumber Co.

Columbus, :-: Ohio.

DUHLMEIER BROTHERS

Mills—TENNESSEE ARKANSAS **Main Office & Yard—CINCINNATI, OHIO, U. S. A.**

OAK and RED GUM

OUR SPECIALTY

Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

At our Tennessee mill we are producing some choice Band Sawn

Plain and Quartered Red and White Oak, Poplar

Prompt Shipments and High Grades our Hobby.

Mahogany

Let us quote you on your requirem

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.
Sinker-Davis Co., Indianapoils, Ind.

BAND SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Co., Grand Rapids, Mich.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Wardwell Mfg. Co., Cleveland, Ohio.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Sidney Tool Company, Sidney, Ohio.
Williams Machinery Co., A. R., Toronto.

BOX MAKERS' MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Porter Machinery Co., C. O., Grand Rapids, Mich.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Sidney Tool Co., Sidney, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Fox Machine Company, Grand Rapids, Mich.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby, A. B., Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.

EDGERS (Gang)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

ENGINES (Steam)
Sinker-Davis Co., Indianapolis, Ind.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

FILING MACHINERY
Wardwell Mfg. Company, Cleveland, Ohio.

FILING ROOM OUTFITS
Wardwell Mfg. Company, Cleveland, Ohio.

FILLERS
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Francis Co., Chas. E., Rushville, Ind.

GLUE JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Francis Co., Chas. E., Rushville, Ind.

GLUE ROOM EQUIPMENT

Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS

Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)

Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)

Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.

GRINDERS (Tool)

Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS

Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)

Bass Bros., New Yerk.
Pyribil Machine Co., P., New York.

GUMMERS, ETC.

Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS

Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES

Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS

Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY

Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Sidney Tool Company, Sidney, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER

Anderson & Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Licking River Lumber Co., South Bend, Ind.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Sawmill Owners Sales Co., Montreal, Que.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Stevens & Jarvis Lumber Co., Eau Claire, Wis.
Stewart-Greer Lumber Co., St. Louis, Mo.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.

HUB MACHINERY

Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES

Black Bros. Machinery Co., Mendota, Ill.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

JOINTERS

Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pyribil Machine Co., P., New York.
Wardwell Mfg. Company, Cleveland, Ohio.

KNIVES (Planer and others)

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Company, Grand Rapids, Mich.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER

Anderson Lumber Co., C. G., Toronto, Ont.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Evans Lumber Co., G. H., Chattanooga, Tenn.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Scrim Lumber Co., W. G., Vancouver, B.C.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.
Timms, Phillips & Co., Vancouver, B.C.

MACHINE KNIVES

Berlin Machine Works, Ltd., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES

Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS

Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES

Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES

Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PANELS

Gorham Bros., Mt. Pleasant, Mich.

PATENT SOLICITORS

Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY

Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fox Machine Company, Grand Rapids, Mich.

PLANERS

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY

Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Sidney Tool Co., Sidney, Ohio.
Smith & Phillips Mfg. Co., Chicago.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)

Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Co., Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

PULLEYS

Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

RESAWS

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P. Q.
Sinker-Davis Co., Indianapolis, Ind.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Co., Sidney, Ohio.
Sinker-Davis Co., Indianapolis, Ind.

RUBBING MACHINES

Curtis Machine Corporation, Jamestown, N.Y.

SAFETY GUARDS

Bass Bros., New York.

SANDERS

Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER

Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY

Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.

SAWS

Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS

Bass Bros., New York.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pyribil Machine Co., P., New York.

SAW SWAGES

Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Fox Machine Co., Grand Rapids, Mich.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

SAW JOINTERS

Diehl Machine Works, G. M., Wabash, Ind.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SCRAPING MACHINES

Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY

Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Pyribil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS

Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Pyribil Machine Co., P., New York.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHELLAC

Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS

Cyclone Blow Pipe Co., Chicago, Ill.
Ormsby Company, A. B., Toronto, Ont.
Sheldons Limited, Galt, Ont.
Toronto Blower Company, Toronto.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES

Fay & Egan Co., J. A., Cincinnati, Ohio
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRINKLER EQUIPMENT

Keiths, Limited, Toronto.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Berlin Machine Works, Ltd. Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.

TRIMMERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Buss Machine Woks, Holland, Mich.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Sidney Tool Company, Sidney, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Sidney Tool Company, Sidney, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Adams & Raymond Veneer Co., Indianapolis, Ind.
Black Lumber Co., Fred W., Chicago, Ill.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company,
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dominion Mahogany & Veneer Co., Montreal, Que.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Hossafous, H. C., Dayton, Ohio.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Talbot-Zoller Lumber & Veneer Company, Cincinnati, Ohio.
Thompson Veneer Co., W. T., Edinburgh, Ind.
Wabash Veneer Company, Wabash, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Francis Co., Chas. E., Rushville, Ind.
Perrin & Company, Wm. R., Toronto, Ont.
Smith Veneer Machinery Co., Watkins, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WINDOW FRAME MACHINERY
Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD PLUG MACHINE
Eagle Machine Works, Indianapolis, Ind.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

YELLOW PINE
Prendergast Co., Cincinnati, Ohio.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher and the Ambitious Student.

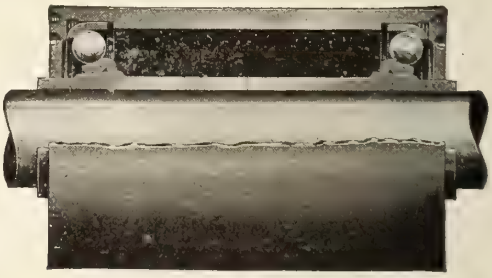
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS GLUE

(VEGETABLE)

SETS—STICKS—STAYS

A substitute is commonly understood to be something which will produce "nearly as good" results.

Many glues are substitutes.

Atlas Glue is not a substitute because it produces better results.

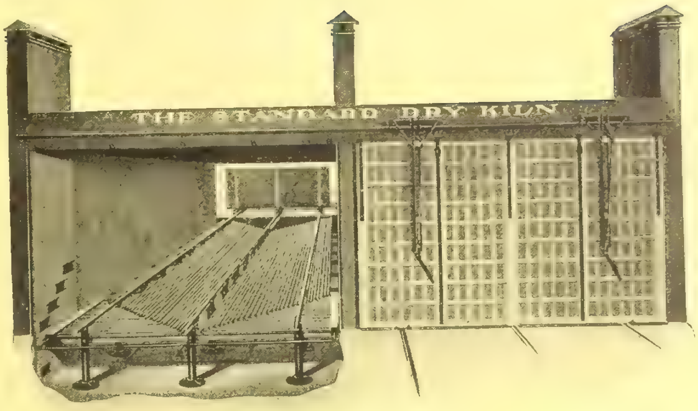
Note these points of advantage:

Heatproof,
Odorless,
Reliable,
Economical,
No Hot Cauls.
No Cold Air Blisters,
Sets Properly,
Does Not Injure the Hands.

Why don't you use the best? We don't ask you to take our word, but are willing to show you.

WRITE NOW—RIGHT NOW

National Process Company
Manufacturers
Address Dept. C. **Indianapolis, Indiana, U. S. A.**



PLANNED TO MEET YOUR DRYING REQUIREMENTS

BECAUSE of its perfect control, The Standard Moist Air System is so adaptable that it will fit into your plant as though it had been especially designed to dry YOUR line of hardwoods.

Our catalog explains how this unequalled adaptability is secured. It also contains a list of users in YOUR OWN LINE, to whom you may refer for corroborative FACTS about The Standard Kiln's success, simplicity and economy. Write for it. Address: The Standard Dry Kiln Company, 1560 McCarty St., Indianapolis, Ind.

Use This Glue Without Heating and Without Waste

This glue does not sour on standing, and can be used a number of days after mixing. It does not have a disagreeable odor. From ordinary glue uses to the most delicate veneer inlaying

Perkins Vegetable Veneer Glue

Replying to your letter of May 25th, regarding Perkins Vegetable Glue, would say that we have been using this glue for some time past and about the best way to describe our attitude is that the glue has been very satisfactory and that we would never consider the use of any other glue for veneering purposes again. There is no doubt in our mind that for gluing up stock it is not only superior, but more economical than any other glue.

Yours very truly,
LEOPOLD DESK COMPANY

assures the highest satisfaction and reduces your glue costs at least 20 per cent. over hide glue expenses.

Perkins Glue is applied cold and is absolutely uniform. Every shipment is exactly the same in quality and uniformity. Climatic changes have no effect upon it and its use eliminates all blistered work entirely.

Hundreds of Desk, Furniture, Door and Built-up-Veneer factories and other glue users use this glue exclusively and are enthusiastic endorsers of its efficiency and economy. Read what the Leopold Desk Co. of Burlington, Ia., have to say of its merits.

Write us today for full particulars, which includes our liberal introductory plan.

Perkins Glue Co., **Patentees and Manufacturers** **J. M. S. Building, SOUTH BEND, INDIANA**

What kind of service does your furniture give in the home?

That is the final and most important test of its quality. Upon it depends repeat orders, prestige, the permanent and healthy growth of your business

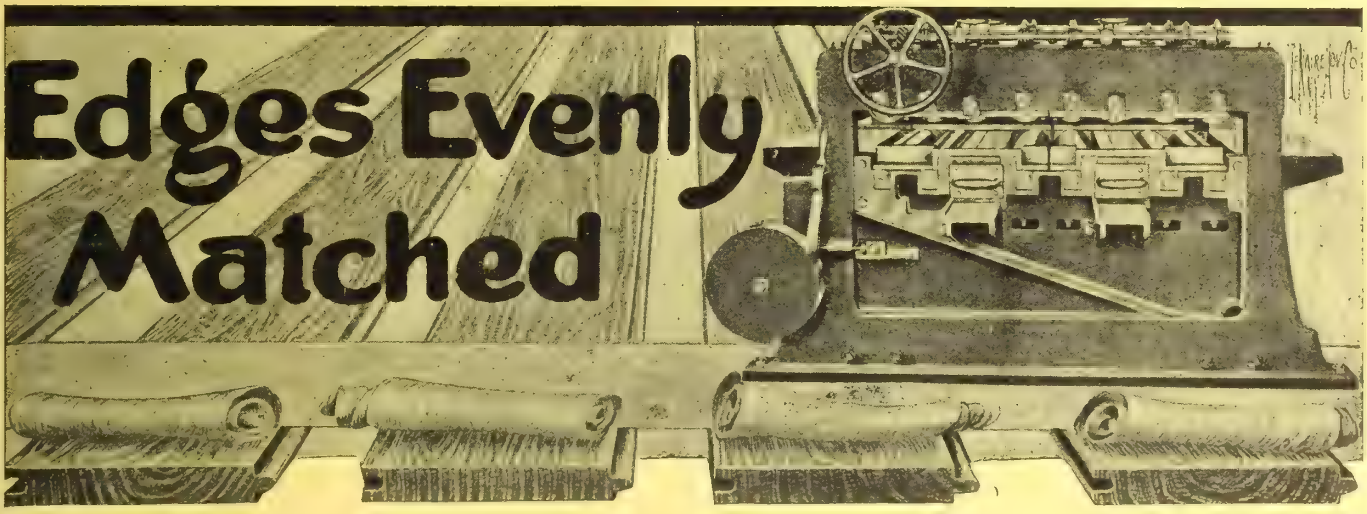
MARIETTA FINISHES give not only the beauty that sells goods, but the quality that *makes* good, by giving everlasting service in den, dining room and boudoir

Write for sample and particulars about our 1914 Process NON-FADING MAHOGANY STAIN

THE MARIETTA
PAINT & COLOR CO.
MARIETTA - OHIO

Volume Fourteen TORONTO, AUGUST, 1914 Number Eight

CANADIAN WOODWORKER and Furniture Manufacturer



Flooring that is passed through

A Whitney Tandem Wood Scraping Machine

comes out with a lustrous finish, with no broken edges or torn-up spots, and with no grit embedded in its surface.

And when the flooring is laid, it must match perfectly, for each strip has the same thickness of shaving taken from it.

This uniform and high quality finish counts in marketing your product and the fact that it can be attained with a Whitney Scraper at a far lower cost for upkeep and operation than any other machine or method would give, means much to your profit.

The smallest Whitney Tandem Scraper, with 15-in. table, admits narrow stuff in multiples of four—its speed of feed is 100 feet a minute, which gives you an output of 400 feet a minute, if you can handle it, done with a mirror finish. There is also a 30-in. Tandem Scraper.

If you write us we will tell the lowness of upkeep and operation costs and prove, by means of samples, the smoothness of finish imparted by Whitney Scrapers.

Will you write?

Baxter D. Whitney & Son
Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office: Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives: Henry Kelley & Co.
26 Pall Mall, Manchester, England

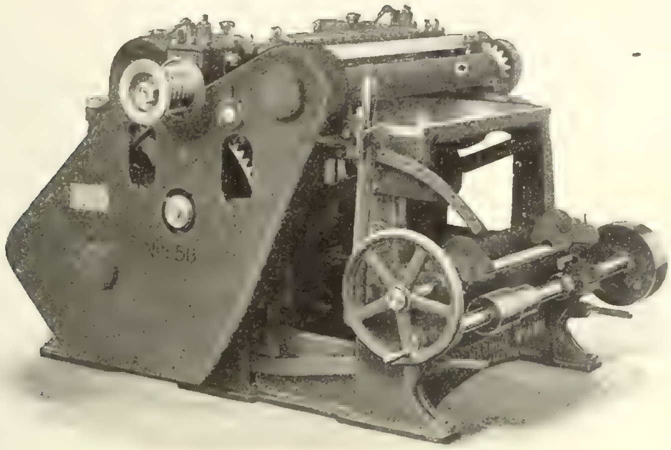
Alphabetical List of Advertisers, page 10

SIMONDS SAWS

Our saw making facilities include all kinds of Saws, Band, Circular, Inserted Point and Cross-Cut Saws, Hand Saws and Hack Saws, also Planer Knives and Files. These products are made with the idea of giving greatest service and greatest quality to the mill operator. When you want anything in the line of a Saw, Knife or File, write us for prices. Order blank and descriptive booklets sent on request.

Simonds Canada Saw Co., Limited

St. Remi St. and Acorn Ave.,
Montreal, Que.
Vancouver, B.C.
St. John, N.B.



Berlin Surfacers

We have specialized in planing machines for years. Berlin surfacers represent the experience of all these years. You can make no mistake by putting your surfacing requirements up to us. We build surfacers for every purpose. Whatever surfacing you want to do may be done at lowest cost on Berlin.

Are Your Cabinet Surfacers Losing Money For You at the Sander?

Don't depend on your sander to correct the inferior work of your surfacers. That isn't profitable. The inefficiency of one machine is handicapping the other.

Surface your stock on the Berlin "156" Single Cabinet Surfacer. Then once through at the sander will suffice. And instead of sanding two pieces at one time the uniformity of the surfacing will enable your sander operator to feed stock across the entire width of the machine. Its efficiency is increased 100 per cent. That assures profit, absolutely.

Equipped with round heads carrying thin steel knives, which may be ground and jointed on the machine, the "156" produces a finish that shines. Sanding all your stock won't be necessary.

The sturdy construction and the use of only proven design features assures low upkeep cost. There'll be fewer necessary shut downs, less lost time. The top in-feed roll and chip-breaker may be sectional. The wedge method of bed adjustment assures its stability. Fine finish is therefore assured always.

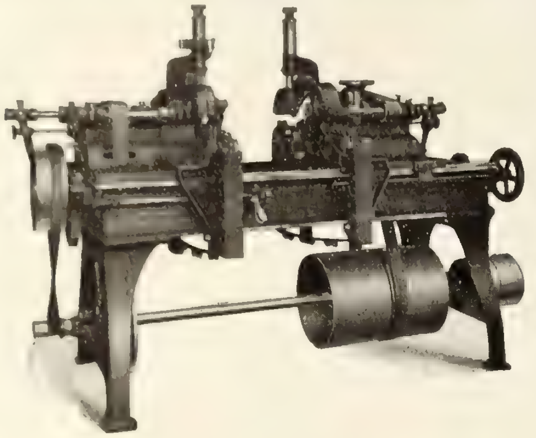
Are you thinking of replacing or adding to your present surfacing equipment? Then judge the earning power of Berlin Surfacers by comparing them with others. Mail your card request for complete data now — so you'll have it for reference when you want it.

BERLIN MACHINE WORKS LIMITED, Hamilton, Ont.

Largest Manufacturers of Woodworking Machinery in the World

UNITED STATES PLANT, - - - - BELOIT, WISCONSIN

That New Spoke Machine

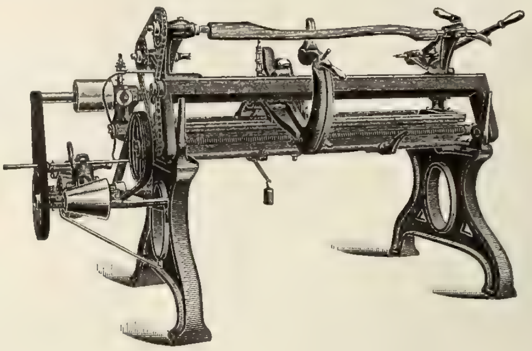


The big wheel manufacturers are putting them in fast.

Don't you be the last one. The machine is a great money saver.

Get it NOW.

J. M. NASH, Milwaukee, Wis.



Once **tried** always **used**

The Ober Handle Machinery

Turning Lathes, Sanders, Shapers, Rip and Cut off Saws, Bolting Saws, etc., for making handles of various kinds.

Neckyokes, Spokes, Wiffletrees, Ball Bats, Table Legs, Spindles, etc.

Write for free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS, O., U.S.A.

THERE IS A DIFFERENCE

IF someone tries to tell you that Garnet Paper is just Garnet paper—that there is no difference—just remember that there is garnet paper and

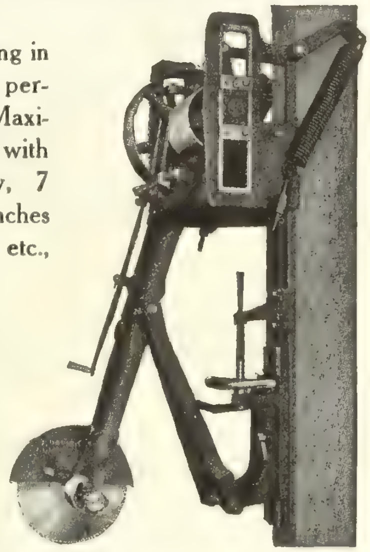
Carborundum Brand Garnet Paper

The difference is there because Carborundum Brand is uniform—it is coated with the cleanest, sharpest of Garnet grain—the glue is of the highest grade—the process of manufacture the best.—Carborundum Brand Garnet Paper cuts faster—gives a better finish—lasts longer.

LET US SEND SOME SAMPLE SHEETS FOR TRIAL

The Carborundum Company
Niagara Falls, N. Y.
Boston New York Chicago Philadelphia
Cincinnati Cleveland Grand Rapids
London, Eng.

PRYIBIL No. 5 Parallel Saw and Groover

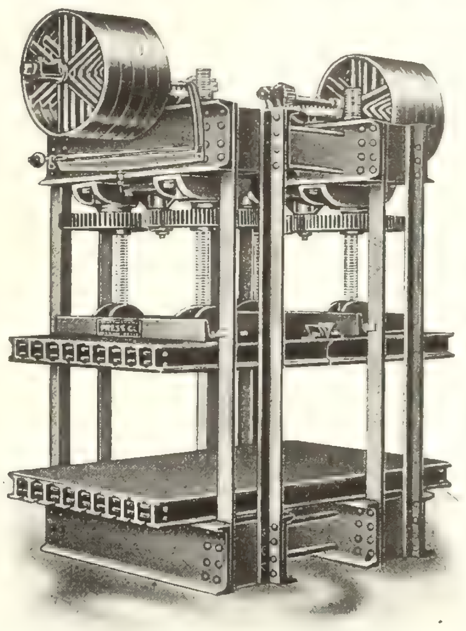


This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL

Books For Sale

The following books are offered at special prices subject to previous sale:

Saw Fitting Manual, a treatise on the care of saws and knives. Deals with everything in the saw and knife alphabet, from adjustments to widths. 144 pages. Price $2.00.

Common-sense Handrailing, by Fred T. Hodgson. Published by Frederick J. Drake & Company, Chicago. 114 pages, illustrated. Price 50c.

Roof Framing Made Easy, by Owen B. Maginnis. Published by The Industrial Publication Company, New York. 164 pages, illustrated. Price 50c.

Handrailing Simplified, by An Experienced Architect. Published by William T. Comstock, New York, 52 pages, illustrated. Price 50c.

How to Join Mouldings; or, The Arts of Mitering and Coping, by Owen B. Maginnis. Published by William T. Comstock, New York. 72 pages, illustrated. Price 50c.

The Book of Lumber Shed Construction, by Met. L. Saley. Published by American Lumberman, Chicago. 176 pages, illustrated. Price $1.00.

Furniture Designing and Draughting, by Alvan Crocker Nye. Published by William T. Comstock, New York. 100 pages, illustrated. Price $1.00.

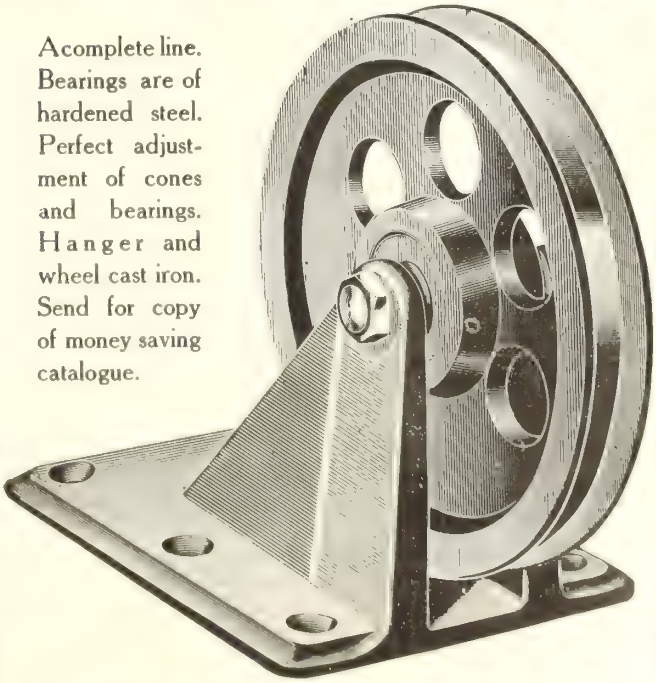
Popular Mechanics Shop Notes, Published by Popular Mechanics, Chicago. Easy Ways to do Hard Things, etc. Years 1905-1906-1907-1908. Price 40c each.

Cabinet Making, by J. H. Rudd. Published by Grand Rapids Furniture Record Company. 210 pages, illustrated. Price $1.50.

Woodworker Publishing Company, Limited
Nicholls Building,
Toronto, - Ontario

Wall Case Pulleys

A complete line. Bearings are of hardened steel. Perfect adjustment of cones and bearings. Hanger and wheel cast iron. Send for copy of money saving catalogue.



Reflector & Hardware Specialty
Manufacturing Company
Western Ave. at 22nd Place, CHICAGO, ILL.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

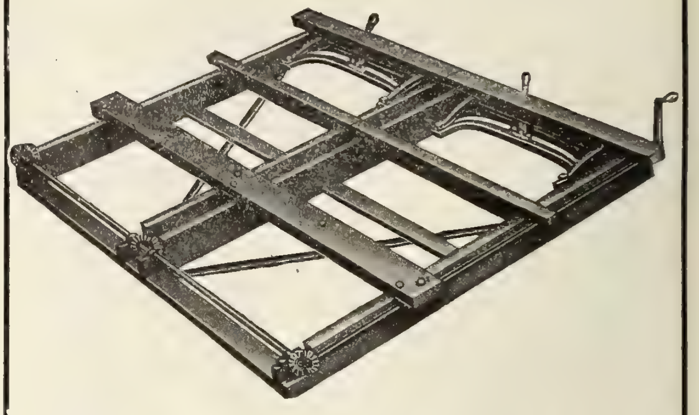
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

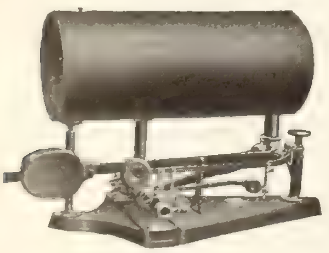
Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.

1456 Front Ave. Grand Rapids, Mich.

DO YOU EVER THINK

of the amount of fuel that is going to waste in YOUR plant through condensation losses? In the average plant 4 pounds of coal is being wasted every week for EACH FOOT of steam piping. Is yours an average plant? If it is, why not make it an exception—why not do away with that preventable waste? Thousands of steam users have realized the extent of their condensation losses and have remedied the condition. Reason was they installed the



Morehead
Back to Boiler
SYSTEM

The Morehead System will keep your steam lines drained perfectly. It will return EVERY OUNCE of condensation directly back to your boilers—at a temperature of 300 to 330 deg. Fahr.—and without pumps or injectors. Don't experiment. Know what you are buying. Profit by our experience. Consult our engineering department. They will advise you, GRATIS, and offer a solution—a permanent solution—out of your condensation troubles.

Write us today.

Canadian Morehead Manufacturing Company, Limited
Woodstock, Ont.

147

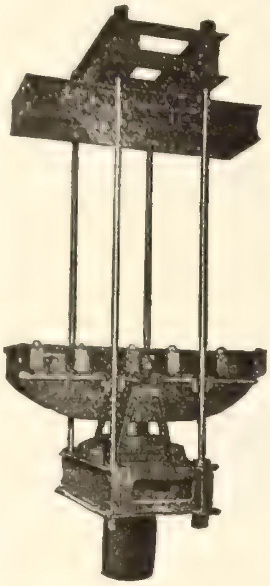
The Business Outlook in Canada

TRULY it is an ill-wind that blows nobody good. One Continent's "down" is another Continent's "up." The industries of Europe are, generally speaking, at a standstill, and matters will be worse before they can be better

The whole world is looking to the North American Continent — to Canada and the United States—for much of its provisions, machinery, textiles, boots and shoes, beverages, vehicles, cement, brick, earthenware, fancy goods, furs, glass, garments, paper, soap, tobacco, wood products, and much else. Canada must get ready to meet the demand made upon her. We have continued prosperity ahead of us if our manufacturers and merchants rise quickly to take advantage of their opportunity.

It is a time for business hopefulness, not for business gloom

Hydraulic Veneer Press

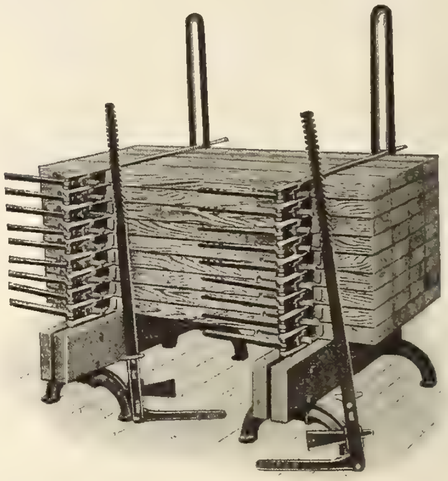


We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

CLAMPS THAT CLAMP



We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

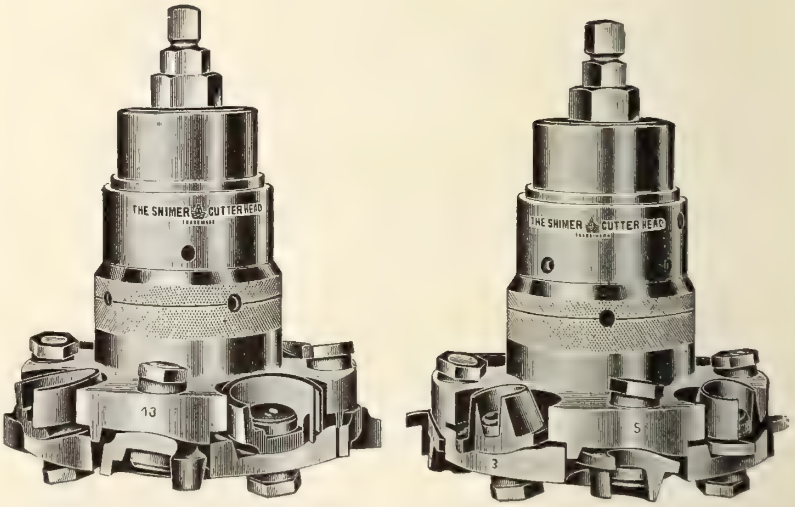
Send for Complete Catalogue

A. E. PALMER & SONS
OWOSSO, MICH.

Cut Operating Costs

in the matching and moulding of lumber by equipping your machines with tools that **save time, labor and material,** and thus augment the natural ability of your men and the efficiency of your machines.

The capacity of your mill to handle successfully the different varieties of work, **is gauged by the tools you give your men to work with.** If they must use old-fashioned Cutter Heads without any labor-saving advantages and shape their own cutters, you are handicapping them and losing money for yourself.



The "Shimer Limited" Cutter Heads, with Expansion, Fig. 627 and Fig. 628

FOR THE HIGH SPEED MATCHER

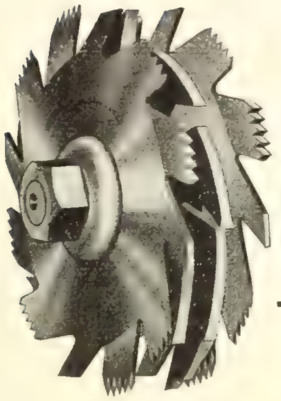
Price, net, for flooring, $72.46 the set, complete.

The long life Circular Bits with which we equip the Shimer Cutter Heads, are moulded into an exact counterpart of your pattern in our factory and never change shape when being sharpened. They are filed like a saw, unless you order Bits tempered too hard to file, in which case they are ground to sharpen. There is no fitting and trying—no delays in touching up the pattern after each sharpening of the cutters. The saving of time thus made increases the actual running time of your machines and consequently the output of your mill.

The set and shape of the Bits on Shimer Cutter Heads enables them to cut fast and at the same time cut clean, allowing you to increase the feed to the capacity of your machine—another item that helps to cut your operating costs.

We want the Shimer Cutter Heads to impress mill men in a practical way, hence our standing offer to send them on trial to any responsible lumberman, returnable if not as represented. Send order today.

Address: SAMUEL J. SHIMER & SONS, Inc., GALT, Ontario, Can.



Patented Nov. 29, 1890
July 19, 1912

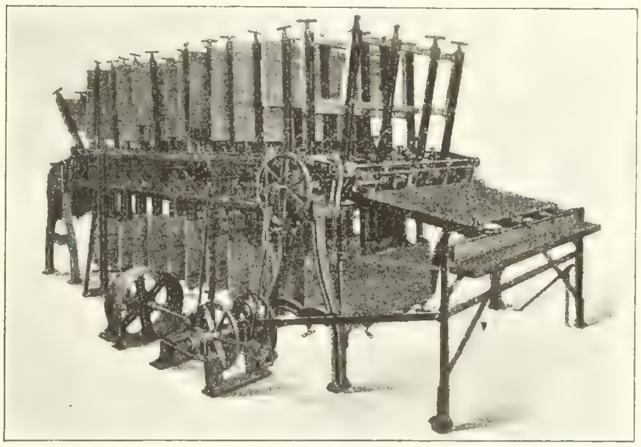
A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co.
Toronto
Williams & Wilson
Montreal
Canadian Agents

Huther Bros. Saw Mfg. Co.

Rochester, N.Y., U.S.A.

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

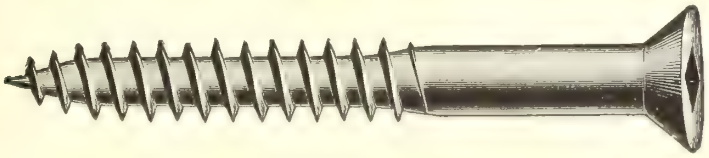
Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

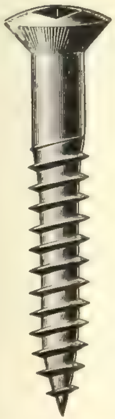
NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

ROBERTSON SOCKET HEAD
Wood Screws



See That Square Hole

Pat. Feb. 2, 1909



THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO

Alphabetical List of Advertisers

Adjustable Clamp Company ... 10
Andrews Company, A. H. ... 51
Arefler Lumber Company ... 49
Atlantic Lumber Company ... 52
Ault & Wiborg Company ... 39

Berlin Machine Works ... 3
Billstrom, Nels. J. ... 9
Black Bros. Machinery Company ... 51

Canada Machinery Corporation ... 12
Canadian Boomer & Boschert Mfg. Co. ... 5
Canadian Morehead Manufacturing Company ... 6
Carborundum Company ... 4
Central Veneer Company ... 44
Central Veneer Company ... 46
Chapman Double Ball Bearing Company ... 58
Chicago Machinery Exchange Inc. ... 51
Cincinnati Veneer Company ... 45
Clark Veneer Company, Walter ... 44
Curtis Machine Corporation ...
Cyclone Blow Pipe Company ... 11

Dennison, Herbert, J. S. ... 50
DeVilbiss Manufacturing Company ... 39
Duhlmeier Brothers ... 55
Dupre & Company, C. ... 49

Galt Knife Works ... 49
German American Stain Company ... 37
Goshen Veneer Company ... 45
Grand Rapids Hand Screw Company ... 6
Grand Rapids Veneer Works ... 52

Haughton Veneer Company ... 43
Hoffman Bros. Company ... 43
Huddleston-Marsh Company ... 45
Huther Bros. ... 9

Imperial Lumber Company ... 55
Invincible Blow Pipe Company ... 11

Jamieson & Company, R. C. ... 38

Keiths Limited ... 51
Kosse, Shoe & Schleyer Company ... 54

Lightfoot, Stanley ... 50

Marrietta Paint & Color Company ... 60
Meakins & Sons ... 37
Mombray & Robinson ... 54
Morton Dry Kiln Company ...

Nash, J. M. ... 4
National Process Company ... 59
National Securities Corporation ... 50
National Veneer & Lumber Company ... 44

Ober Manufacturing Company ... 4
Ohio Veneer Company ... 43

Palmer & Sons, A. E. ... 8
Penrod Walnut & Veneer Company ... 46
Perkins Glue Company ... 59
Perrin & Company ... 8
Petrie, Limited, H. W. ...
Powell-Myers Lumber Company ... 53
Prendergast Company ... 54
Pryibil Machine Company, P. ... 5

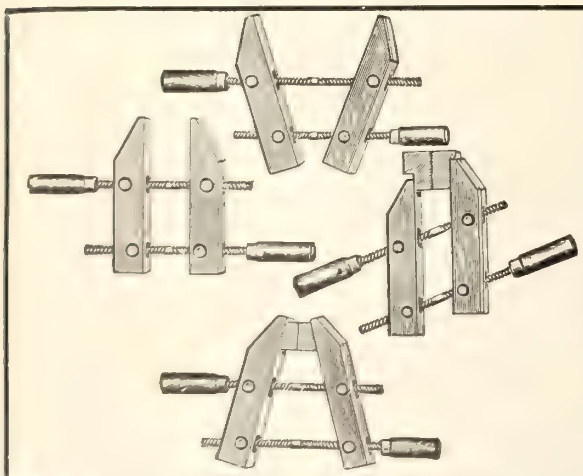
Reflector & Hardware Specialty Mfg. Company ... 5
Robertson Manufacturing Company, P. L. ... 9

Saw Mill Owners Sales Company ... 49
Schmidt Company ... 39
Scientific American ... 50
Scrim Lumber Company, W. G. ... 52
Shawnee Lumber Company ... 55
Sheldons Limited ... 11
Shiels & Company, Chas. F. ... 54
Shimer & Sons, Samuel J. ... 8
Simonds Canada Saw Company ... 2
Spencer, C. A. ... 52
Standard Dry Kiln Company ... 59
Steven & Jarvis Lumber Company ... 52
Stewart Greer Lumber Company ... 49
Stimson, J. V. ... 53
Strong Veneer Company ... 6

Talbot-Zoller Lumber & Veneer Company ... 54
Thompson & Company, Lewis ... 44
Thompson Veneer Company, W. T. ... 43
Thompson Hardwood Lumber Company ... 55

Whitney & Son, Baxter D. ... 1
Wilcox & Knapp ... 52

Young & Cutsinger ... 53



The Jorgensen Adjustable

is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company

215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng., Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.

Slow Speed Low Power Shaving and Dust Collecting Systems

New Systems designed. Old systems corrected.
Long distance blows a specialty.

Trained Mechanics. We know how.

Consult our Expert

INVINCIBLE BLOW PIPE CO.
CHICAGO 176 George St., TORONTO

1913 Edition

"Practical Pattern Making"

A Practical Work on

The Art of Making Patterns, written by a pattern-maker with thirty years' experience. Contains information on Pattern Making and Pattern-Makers in general, also a detailed description of the necessary materials and how to use them. Then the tools, both hand tools and machine tools, with special chapters on the Lathes, the Band Saw and the Circular Saw, with many examples of work which may be done on these machines.

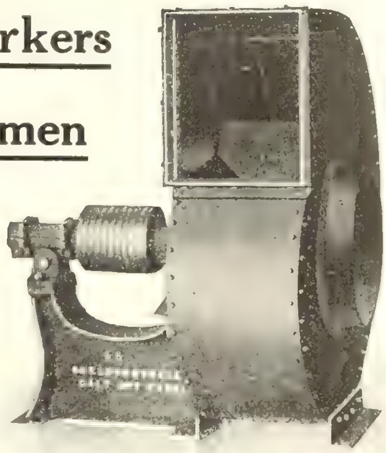
A complete section of illustrated examples of Pattern-Work in wood, with many pages of metal pattern-work, Gating and Plate work. Both Vibrator and Stripping Plates are shown. Specific instructions for plaster work are given, and finally, the cost, marking and record of patterns are explained and illustrated.

By F. W. BARROWS

Price $2.00

CANADIAN WOODWORKER
Nicholls Building, TORONTO

Woodworkers
and
Lumbermen



The Sheldon Exhaust Fans have characteristics that adapt themselves to the service of the Planing Mill or Wood-working Plant. They are specially designed for this kind of work, having a saving in power and speed of 25% to 40%.

Write for Industrial Booklet.

SHELDONS LIMITED - Galt, Ont.
Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 412 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259-261 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alt
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.

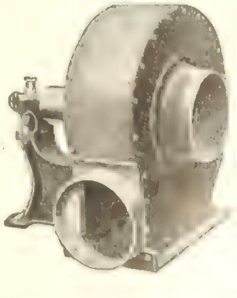
(Patented)

Cyclone Blow Pipe Co.

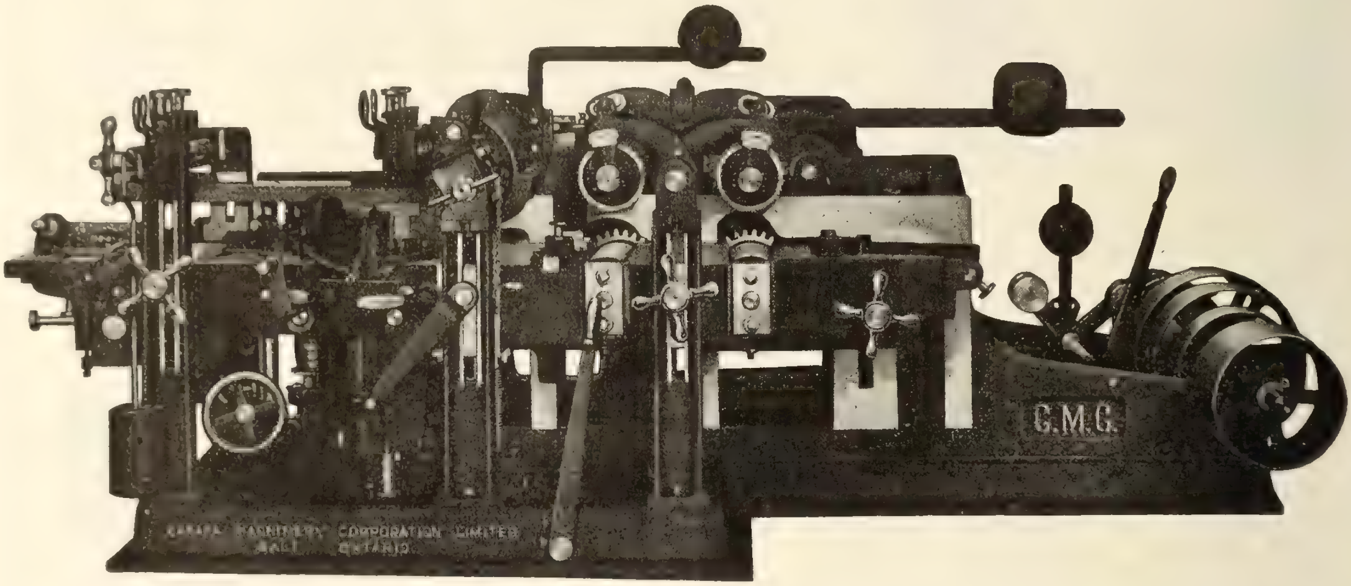
Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.
Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.



12" Moulder **C.M.C.** **12" Moulder**



12" HEAVY DUTY FOURSIDED MOULDER

59 of these moulders in successful and satisfactory daily operation in Canada.

This is our latest type of heavy, outside moulder, mounted on a substantial base, and is one which we thoroughly recommend for all classes of work. It is heavy and substantial in all parts and capable of doing the finest work, while at the same time it is extremely convenient in adjustment and can be set up for any job in a minimum time.

We have paid particular attention to the feed, and believe we have here a machine with a stronger and more powerful feed than any other of its type. We have also paid special attention to guarding the machine wherever possible, to insure safety of the operators.

It is built in two sizes to work 10" and 12" wide.

Bulletin No. 303 fully describing this machine sent on request.

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Canadian Woodworker

**A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring,
woodenware, furniture, pianos, boxes, and general mill products.**

Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

**Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.**

Nicholls Building, Toronto
Phone Ade. 929

Authorized by the Postmaster General for Canada, for transmission as second class matter.
Entered as second class matter July 18th, 1914, at the Post Office at Buffalo, N.Y., under the Act of Congress of March 3, 1879.

Vol. 14 **August, 1914** **No. 8**

Practical Woodworking Essays

(Read Publishers' Announcement on page 33.)

THE publishers of the Canadian Woodworker offer bi-monthly prizes to the value of $30.00 ($20.00 and $10.00 respectively) for the best essay on some subject of practical interest to the trade. The object of the competition is to ascertain the most efficient methods of woodworking practice in its various branches, and preference will be given to articles affording a clue to the solution of the more general difficulties encountered in the trade, and to those illustrative of "short cuts."

There are few workmen who have not attained individual proficiency in some special detail and the idea is to present the sum total of such proficiency in a series of articles which will promote the best interests of the trade and be of outstanding value to all connected with it.

In a feature of this kind, which is intended to provide the trade with practical pointers, and which is essentially a competition for men with practical ideas, it is impossible to suggest definite subjects. With a view to offering our readers a few suggestions, however, we mention the following articles which have been selected on their practical merit for reproduction in recent issues of this journal:

The Davenport—An Interesting Problem in Cabinet-Making.
Band, Scroll, Circular and Metal Saws.
Nature and Use of Varnishes.
Manufacture of Flush Veneered Doors.
Safeguarding Woodworking Machines.
Why Band Saws Snake or Lead.
How to Make a Phonograph Record Cabinet.
Rule for Laying Out Molding Cutters.
Proportioning and Laying Out Doors.
Short Cuts for the Furniture Factory.
The Selection of Belts and Pulleys.
The Care of Saws in a Furniture Factory.
How to Make a Combination Writing-Desk and Book-Case.
Practical Methods of Building up a Staining Color.
The Utilization of Veneer Waste.
Practical Hints in the Art of Marquetry.
The Operation of the Band Scroll Saw.

It is hardly necessary to tell competitors that the value of their contributions will be considerably enhanced if accompanied by illustrations. Preferably the drawings should be executed neatly in Indian ink, but rough sketches will be accepted and re-drawn. Essays should be written on one side of the paper only, with good marginal space, and should not exceed 1,000 words in length. Communications should be sent to the Editor, Canadian Woodworker, and the envelope marked in the lower left-hand corner, "Competition." The publishers reserve the right to reproduce the articles submitted and to pay for them at standard rates in the event of there being an insufficient number of entrants.

The winning essays in the first of these bi-monthly competitions will be published in the October issue of the Canadian Woodworker. Articles should reach the Editor not later than September 30.

Competition awards will be based upon the practical value of the ideas contained in the article, and not upon literary merit and arrangement. There are many factory hands with an expert knowledge of some branch of their trade who have not sufficient time to acquire the facility of writing smooth English. In this there need be no discouragement.

Send us your copy, and we will put it in shape for publication and judge it on its worth to the trade.

Remember that the scope is unlimited. The competition affords an opportunity to the worker in the furniture factory, piano factory, box factory, sash and door factory, planing mill and every other branch of the industry. Your particular information may relate to some special phase of finishing or veneering, to something bearing upon the efficiency and output of your machine, to the care of knives and saws, to the handling of lumber, and to a score of other things. Let us know about it. Enter the competition and subscribe to the policy of the Canadian Woodworker, which is to promulgate the best ideas offering, produce better workmen and make for increased efficiency in the plant.

Ash is a wood that was prominent in cabinet work back in the middle ages, and it has been identified with it ever since, but at the present time it is not as prominent a feature as some of our native woods. One finds ash used in hardwood veneered doors, occasionally in furniture, and quite often in the making of pews and church furniture. There are many different kinds of ash, and there is quite a variety of figure obtainable.

The European War in Its Relation to Canadian Trade

A Time When Courage and Confidence Await the Dawn of Greater Opportunity—Every Incentive to Maintain the Country's Business Stability and Prepare the Way for Expansion—Exports and Imports

NOW that everyone has had the opportunity to express an opinion as to the probable duration of the war, the cost of it in men and money, its effect upon trade, and a dozen minor phases, there would appear to be some justification in taking a little time to sift the material—to separate fact from fiction, and to strike a midway course between the optimism offering on the one hand and the excessive pessimism prevalent on the other.

We are concerned with a brief consideration of the status and prospects of the trade of this country in relation to the struggle in Europe, but as an aside it may be observed that any close speculation as to the duration of the war is foolish at the present juncture. Precedent does not help us, the conflict being of an entirely new order: all that we can reasonably surmise is that the very magnitude of the operations to which the German Empire has committed itself will prove its undoing in a matter of months, however thorough its preparations may have been. At the time of writing, the allied forces of France and Great Britain are now in line preparing to check the enemy's encroachments, and, with the Russian army looming up large on the horizon, and British mastery of the sea already asserting itself in the re-opening of trade routes, we can only wait—firm in the conviction that the potent forces of might and right arrayed against the German war fiend must prevail.

Confidence the Keynote

In taking stock of present conditions, it is gratifying to find that loyalty and confidence are the keynotes of the situation. One may point to projects postponed, to establishments closed, to reductions of staffs and salaries, and so on; but, after all, these are not a fair gauge of the people's attitude. Nine out of ten employers are firmly persuaded that Canada's prospects are as sound as ever, and they are prepared to make a temporary sacrifice with a view to sharing in the greater harvest that will be reaped after the war. In this attitude there is the truest patriotism. It is not given to every man to fight, but to every man who cannot fight is given the opportunity to do his share in maintaining the productive power and business stability of his country.

By such eminent economists as Sir George Paish the view is taken that the present war will open up a tremendous opportunity for Canada and the United States. It is held that if the tide is taken at the flood it will mean not diminished but greater prosperity for us. Financial embarrassment must be experienced for a time, but this is an evil which will be common to the whole world. With the maintenance of ocean traffic and the opportunity to dispose of our farm products, the speediest recovery will surely come to Canada. New lines of activity will compensate in part at least for the depression in others. Far removed from the scene of hostilities, the internal trade of this country should suffer as little as any in the world.

Canada's Trade Mainly Within the Empire and with the United States

An examination of actual facts and figures cannot but be reassuring to the manufacturing interests of Canada. We find that in the fiscal year ending March 31 last our exports and imports represented a total value of more than a billion dollars—the greatest figures in the country's history. In this period a great stride was made in our exports, which amounted to nearly $432,000,000. The amount of trade done with the present enemies of the Empire was inconsiderable: our exports to Germany and Austria-Hungary combined amounted to less than four and one-half million dollars, while our imports from these countries were nearly four times as great. It is questionable whether it would not be in Canada's favor if the exchange of business were wiped out. Naturally the war will affect seriously the buying power of other European countries, but it must be remembered that our business with Europe constitutes only a small part of our external trade and that it is the other countries of the British Empire and the United States that are our best customers. Canadian exports to Continental Europe last year amounted to less than twenty million dollars, while our commerce with other parts of the Empire consisted of exports to the value of some $239,000,000, and imports amounted to $154,000,000—a total of $393,000,000. With the United States our trade consisted of exports amounting to $200,000,000 and imports valued at $411,000,000, a total of $611,000,000. Thus our trade with other parts of the British Empire and with the United States amounts to upwards of a billion dollars. With these things in mind and the knowledge that Germany's merchant vessels are being driven off the sea, one may surely conclude that ultimately the war will have a good effect upon British (including Canadian) and United States trade. Depend upon it that much of the German competition which British and American manufacturers have had to cope with in the past will be wiped out and that Canada will share in the transfer of the trade which Germany will undoubtedly lose.

In a sane, well-balanced consideration of conditions and prospects, we must not overlook the fact that one of the most certain results of the war will be a world-wide scarcity of capital for investment purposes. It is impossible to foresee in detail the far-reaching results of the changes that are taking place in the value of capital, but a natural outcome is that the carrying out of constructional works and public improvements will be considerably hampered. The activity will be all the greater when constructive enterprise finds its level. All the more vital is it for us to hold our ground.

The Ebb and Flow of Prosperity

Prior to the outbreak of hostilities, we had entered upon a period of depression. The explanation of this depression is not hard to find in economic theory. The value of all products is dependent upon the demand; while manufacturing facilities and outputs had been increasing by leaps and bounds there had been a number of extremely grave developments tending to diminish the demand. The greatest development of all, unforeseen though it was, was the preparation that was being made for the present war.

As a matter of fact, history shows us that trade depressions travel in cycles. Ever since England became a manufacturing country she has encountered an almost constant ebb and flow of activity in trade. Even in periods when there have been no outstanding disturbances like the present one, the cyclical movement has been definitely marked. It has been observed that from 1887 to 1896 the cycle ran in the order of revival, marked revival, prosperity, decline, depression, and slow revival; and from 1897 to 1906—prosperity, great prosperity, culmination of prosperity, slow ebb, depression, distress, revival, prosperity. History establishes clearly that the cyclical movement is part and parcel of the normal system of industry.

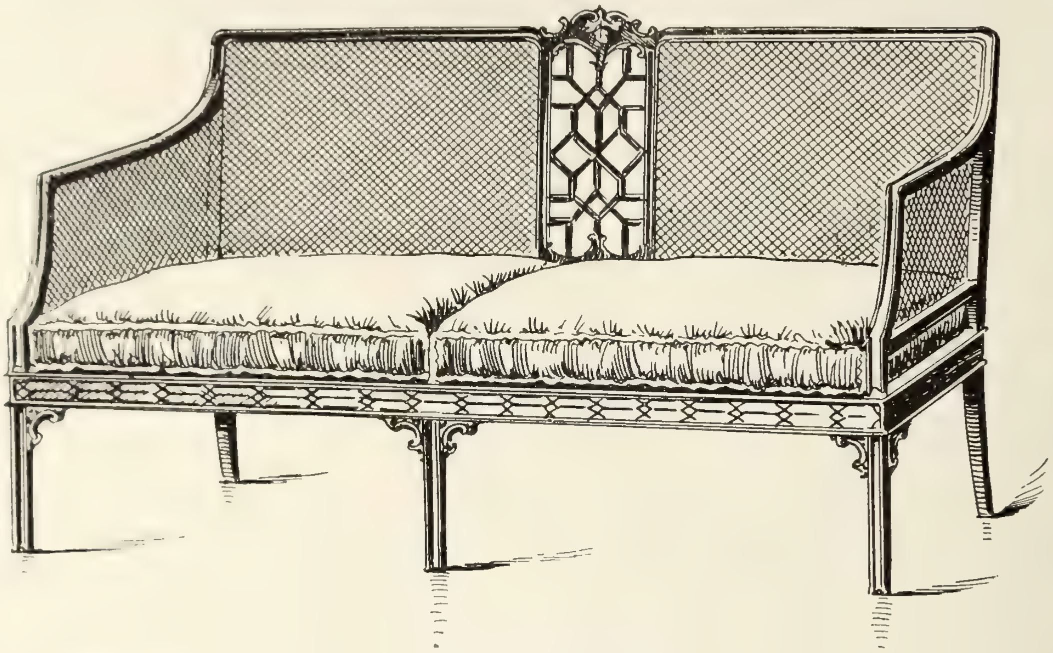
Encouragement from the Past

After the Napoleonic wars one hundred years ago, it was not long before England was on a quick run to prosperity. Marked improvement took place in almost every branch of domestic industry; funds rose, revenue increased, manufactured lines were in great demand, money was abundant, sales of land improved, gold re-appeared, and depression gave place to hopefulness and enterprise. We can glean encouragement from the leaves which record the experiences of other days.

It is only to be hoped that that great majority of us whose faith in Canada's destiny is unalterable will rise to the present emergency by united effort and preserve the internal stability of the country. There is ample reason to hope that, even with a continuation of the war for some time, there will arise new demands for industry to offset those that are cut off. From now on the factories of Germany, France and England, depleted as they will be by the call to arms, will scarcely be able to meet the demands of home consumption. Here, then, will be the opportunity for Canada and the United States. Markets will arise in other parts of the British Empire, and these will be strengthened by a feeling of greater reliance in Canadian and United States products. "It is an ill wind that blows nobody good": possibly one of the most marked benefits that will arise out of this terrible conflict will be the stimulus afforded the manufacturing industries of the North American continent. The cessation of imports from continental Europe into Canada will give many home industries an unexampled opportunity for immediate development on an enterprising scale. Canada has a home demand which must be satisfied, and, with the untold natural resources of the country, we can look with confidence to the supply from within. Much of the new trade will be held, and so Canada will prosper at the expense of the belligerent countries.

We are persuaded that the greatest desideratum of the moment is confidence. It was the supreme confidence which Drake had in his fleet which enabled him to finish a game of bowls before he engaged the Spanish Armada—and the odds which Drake faced, with the Spanish fleet in the offing, were surely as great, in proportion, as the Empire is concerned with to-day. If, as time goes on, Britishers show themselves possessed of that calm self-control which is so essential to success on land or by sea, in peace or war, their destiny will not be shaken by the outbreaks of a dozen crazy fanatics like the Emperor William. We of Canada to-day share with the rest of the Empire the responsibility of showing that confidence which will not only inspire courage in recruits for the front, but produce men of calm judgment at home to maintain our reputation as a well-balanced business community. We have the ships, we have the men, and we have the money. There is no need for us to be apprehensive of the present conflict. Let us look to business and avoid panic.

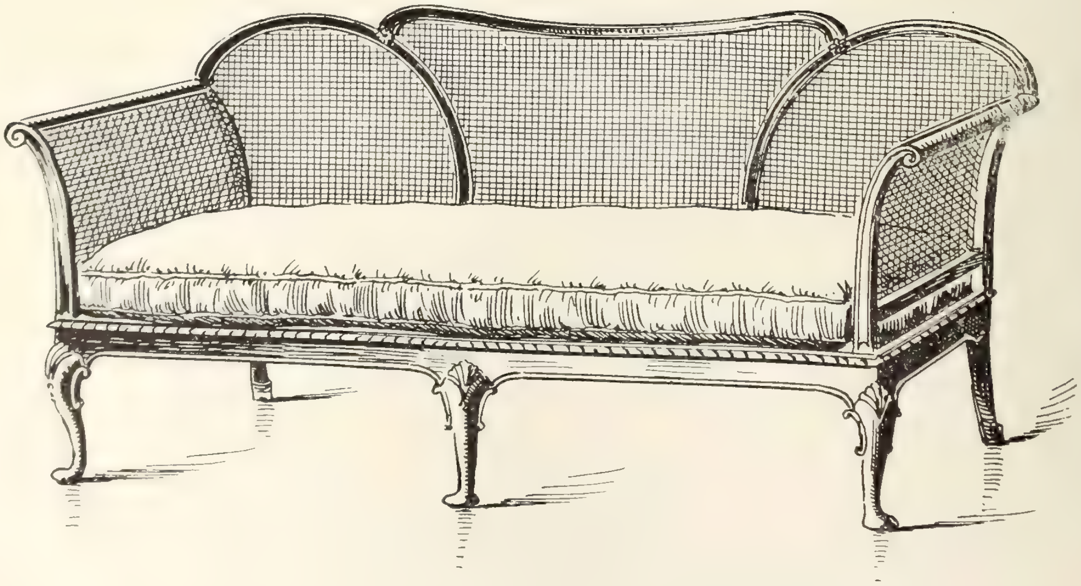
The value as a hobby of collecting hardwood and working it into artistic designs has been demonstrated by a woodworker at Newcastle, Ind. For forty years he has been collecting woods from all over the world. In his leisure hours he has fashioned these into parts for a desk, four ft. six ins. high and three ft. four ins. wide, with thirty panels and twenty-one drawer fronts. Each panel and drawer front is in itself a work of art, showing great color beauty. The parts are now ready to be assembled. They represent 250 different kinds of wood and 50,000 pieces. An interesting feature of the work is the white holly drawer front inlaid with ebony. Many of the bits of wood in this 50,000-piece desk are souvenirs from historic trees, battleships and buildings.



Original design for medium-class settee, Chippendale style, carved and caned, with loose cushions. Made in mahogany, and finished in antique color.

Improved Designs in the Furniture Field

REPORTS from the furniture manufacturing field point to the conclusion that no material changes in styles and designs are taking place this season, though a general improvement along the entire line is apparent. The belief that conditions in the furniture trade will gain substantial impetus this fall appears to be well grounded. The expected large crop returns are certain to go a long way towards relieving what would otherwise prove a dull season. Therefore the manufacturers, in anticipation of the purchase this fall of large quantities of new furniture, have put out full and attractive lines. Some of these lines were evident at the July furniture show at Chicago, where the best trade was catered for, good classes of furniture being displayed conspicuously. A good deal of Circassian walnut is in evidence this season and this is particularly the case in regard to bedroom furniture. In maple the bird's-eye figure is apparently the most prominent. Plain maple, however, is seen here and there, sometimes in contrast with bird's-eye, while in other instances it is alone. Imitations of Circassian walnut are not pushed this season, although there is likely to be some demand for red gum. Birch, which is one of the favorite woods

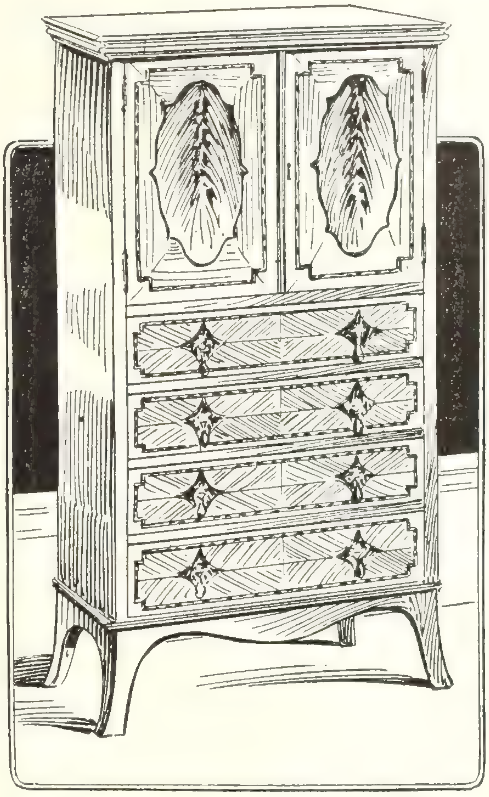


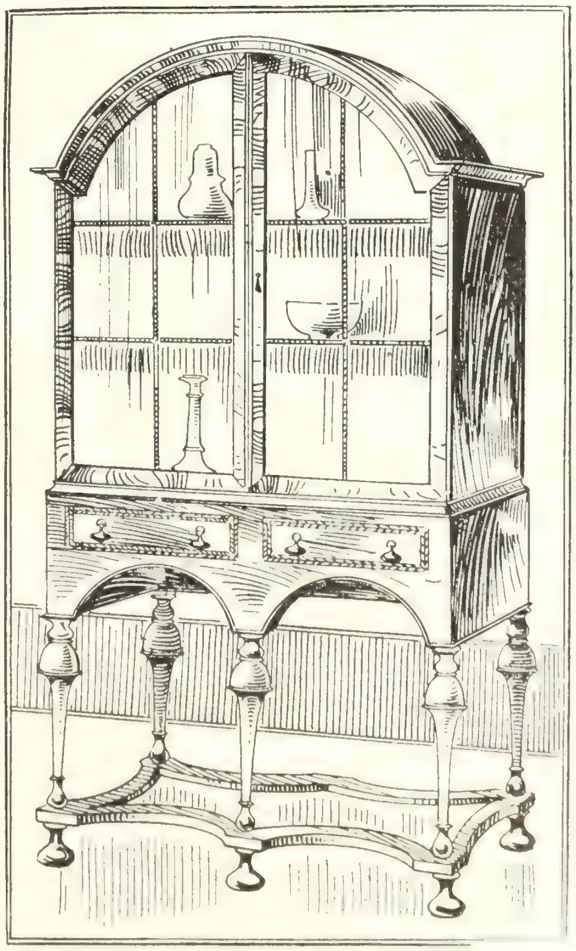
Medium-class settee, Queen Anne style, with walnut frame.
(The illustrations on these pages are reproduced by courtesy of the Furniture Record.)

for imitating mahogany, is reported to be gaining ground in popular favor. Some high-class furniture is entirely of birch. In appearance it is a favorable competitor with mahogany. It possesses several advantages over certain other woods. In the first place it is stronger and harder than mahogany. Then again it may be finished in almost any color desired. In bedsteads, bureaus, tables and stands, the posts, rails and other parts which demand strength, are usually of birch if the other portions are of mahogany. Oak, the giant of furniture woods, is maintaining its lead if the quantity of oak furniture on exhibition at recent shows is a reliable guide. Indeed it is not too much to assume that its use amounts to almost as much as all other high-grade woods combined. Plain oak occupies a prominent place, taken in conjunction with quartered, and judging by the samples shown by exhibiting manufacturers the dull finish promises to become quite as popular as the highly polished surface. Other high-grade finishes present in moderate quantities this season include fumed oak and chestnut, but there is nothing new in regard to styles. The manufacturers are said to have derived much encouragement from the active buying which was so pleasing a feature at the various furniture shows, notably Grand Rapids. Naturally, this is taken to indicate a revival of business in the furniture line.

The Early History of Wood-Inlay

Wood-inlay, in ivory, bone and thin brass plate, is carried on in the Punjab, India. The ivory and bone work resembles the Italian intarsia, being equally effective, though less highly finished. It has been largely developed at Hoshiarpur within the last forty years, and, like the wood carving (with which it is often combined on the same piece), is now very largely exported. This "Hoshiarpur work" is an old industry of that place but up to about thirty-five years ago it had been applied mostly to the decoration of small articles, such as boxes, pen-cases, walking-sticks, and bathing pattens. Then the great development took place, and the work was applied to furniture, some handsome pieces being shown in the Lahore Exhibition of 1881-1882. The wood used is almost entirely sheeshum, though sometimes the North Idaho ebony is used when procurable, and is very effective. Similar work is done in other parts of India where the work is as yet finer; but the Hoshiarpur work has a character of its own. It may be hoped that it will gradually improve in quality and design, if the artists and artisans are stimulated to do their best. As in the case of many other Indian art industries, however, the demand for cheap and hasty production is very harmful. The history of the inlay work in India is not at all clear. The work as practiced at Hoshiarpur may have been introduced by Italian artificers about the time of the building of the Taj Mahal, over 300 years ago. There is a tradition that Shah Abbas sent art students to Rome from Persia, and the art of intarsia, learned in Italy, may have come, like other arts, to the Punjab from Persia. It is said to have been introduced into Mysore in the time of Haider Ali. In Mysore, there is an idea that intarsia was introduced into north India by Italian merchants. It seems not improbable that Florence, where similar work still flourishes, has been the mother city of the work, whence it has spread into the East.


Music cabinet, in mahogany, veneered and inlaid.


A handsome walnut cabinet, cross-veneered, with herring-bone banding.

Construction of an Oak Handrail for Stone Stairs

ONE of the problems which confronted an English builder not long since was the construction of an oak hand rail 4 x 3 in. in cross section and the attaching of it to a stone staircase having a quarter space landing. The plan shown in Fig. 1 is set out as indicated in Fig. 2. It is presumed that the outer side of the rail will be plumb with the outer ends of the steps. Then a radius c-r up to 2½ in. will allow sufficient space under the rail for the panels.

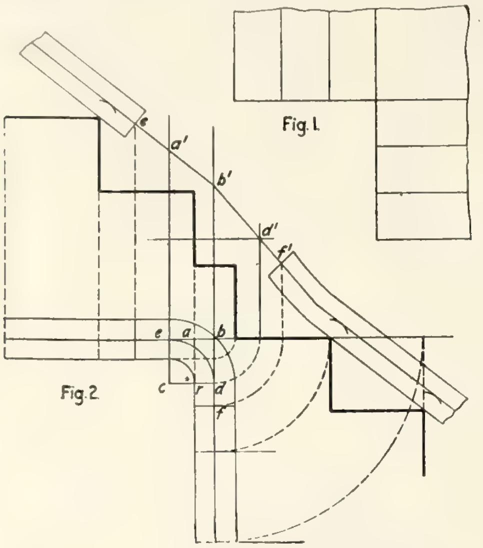


Fig. 1 and 2—Plan and elevation of the stairs.

Next set out the development of the tangents which show the two pitches of the wreath and ramp respectively, joining the lower straight rail.

In Fig. 3 is shown the layout of the face mold and bevels for the wreath. Having drawn the plan of the wreath and the plan and development of the tangents as indicated extend a'-b' to n in x-y; join n-d which is the horizontal trace.

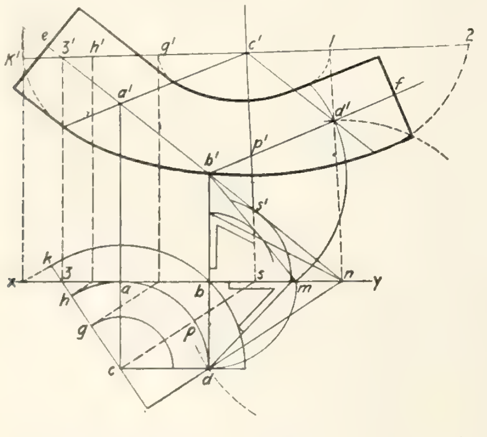


Fig. 3—Development of face mould and bevels for wreath.

Obtain the point d' as shown, and draw the tangent b' d'. Draw c s parallel to n; project up for s', then draw s' c' parallel to n d' then s' d' is the direction of the minor axis.

At right angles to n t draw t k through c (this is the plan of part of the major axis). From 3 project up and obtain 3' then through 3' c', and produce each way, and thus obtain the direction of the major axis.

Project parallel to t n from k g to x y, next vertically to n e, and then parallel to n d', which gives k' g', and thus c' g', c' k', are half the major axes for curves. Make c' p' equal to c p, and mark off half the breadth of the rail on each side of p'.

Half the minor axes are obtained as shown, and then the face mould can be completed in the usual manner.

With b as the centre draw an arc touching b' n, and where it meets x y join to d; this gives the bevel for the upper joint e. With b as centre draw an arc touching b' m, and where it meets b b' join to n, which gives the bevel for the lower joint.

A Process for Rendering Wood Fireproof

The discovery of a satisfactory process by which wood is rendered more or less proof against fire would appreciate the commercial value of timber enormously. The British Admiralty has favorably considered the following process of treatment: The wood is placed in large iron cylinders, the doors of which are hermetically sealed. The wood is then subjected to a course of steaming, and under vacuum the air and moisture in the pores of the wood are removed and the sap vaporized. The fireproofing solution is thereafter run into the cylinders, and under pressure forced throughout the pores and fibres. Subsequently the water in the solution is evaporated in drying kilns, and the chemicals, in minute crystal form, are left embedded in the wood. When heat is applied these crystals expand to many times their original size, forming a glassy coating to the fibres of the wood which excludes the oxygen in the air. In time the heat causes the crystals to collapse, but further crystals in the wood immediately expand, and the same process of resistance against fire continues. The chemicals used are antiseptic and preservative, consisting chiefly of phosphate of ammonia. As a result of the treatment the life of the wood is also lengthened, for the cause of decay is eliminated. This process is claimed to be satisfactory, inasmuch as the material treated is not saturated with a solution of salt, nor are such chemicals used as tungstate of soda, sulphate of ammonia, sulphate of alumina, alum, etc., which invariably cause discoloration of the wood, corrosion of metals, destruction of fibres, and prevent satisfactory painting or polishing. After this treatment the wood can be worked, nailed, glued, painted, polished, etc., as though it had not been subjected to any special process. All kinds of timber can be treated, including oak, teak, deal, pine, mahogany, walnut, beech, birch, ash, maple, yellow poplar, pitch-pine, larch, etc.

There are many useful ways of disposing to commercial advantage of waste wood. Not the least commendable one is reported by the United States Forest Service. According to this source we learn that waste wood from the manufacture of school desks is now being used for the backs of cheap brushes. A large manufacturer of school desks in Michigan had a considerable quantity of waste material in sizes which were too short to enter into the manufacture of the smallest desks. This stock was all hard maple in pieces one-inch thick, one foot or so in length, and about three inches in depth. It has been the custom to consign this material to the waste pile and dispose of it as firewood. This waste amounts to from 1,000 to 1,500 board feet daily. Another manufacturer was using practically the same quantity of maple which he was sawing up into small pieces for making the backs of cheap brushes. Members of the Forest Service investigating methods of eliminating factory waste conceived the idea that the blocks used by the brush factory could be readily secured from the waste of the school desk manufacturer. Therefore arrangements were made so that the brush manufacturer now places orders with the other firm for its raw material, and what was formerly waste is now a source of profit.

Lining up the Band Scroll Saw

Contributed by Jerome Butler

WHILE there are no doubt a great many band sawyers who are quite proficient in the proper procedure, there are probably quite as many who are younger at the business and who from lack of experience are somewhat at a loss to know how to go about it. It is to the latter that I wish to address myself, for I am anxious to see a goodly number of the coming young men acquire the art of this most interesting and profitable occupation, so that in future there may be an ample supply to meet the steadily growing demand.

In order to accomplish a first-class job of lining up the band scroll saw the first move on the part of the operator should be to go over all the bearings carefully and where lost motion is found it should be taken up, not merely by removing a liner and tightening down the cap, but if necessary it should be carefully scraped to the required fit. This is important for there is probably nothing that will break the narrow saws quicker than lost motion in the bearings of the lower wheel arbor.

When the upper and lower bearings have all been adjusted we may proceed to set the lower wheel. This should be so adjusted as to be square with the table as, for instance, if the table is level the wheel should be plumb. The object of this is to get the tooth edge of the saw square with the table, as in Fig. 1 of the accompanying sketch, so that when sawing scrolls or other work where several pieces are cut at one time, the saw cuts may meet perfectly.

The lower wheel having been thus adjusted remove the table and stretch a line from a to b (Fig. 2). Then adjust the top wheel so that the line merely touches the lower rim of the top wheel and the upper rim of the bottom wheel.

I might say here that there are exceptional cases where the foregoing will not work out owing to errors in the construction of the machine. In such cases the lower wheel's relation to the table will have to be altered in order to get it into line with the top wheel and the table altered to suit the wheels. This may be done by putting sheet metal liners under the table at the back or front as the case may require, until the desired adjustment is obtained. When the wheels have been made to line perfectly from a to b change the line to points c and d and adjust till the line just touches the opposite rims as in the case of a to b. This must be done by using the side screws on either the upper or lower wheel. When this adjustment has been perfectly made change the line to points e and f and when these points have been made to show perfect change the line back to a b, which, if the work has been accurately done, will show perfect. In case it does not the whole operation should be again performed. To get the wheels perfectly lined by the foregoing method is a simple matter, but to keep them that way occasionally seems to be a more difficult task, and is usually the result of carelessly tightening the jamb nuts. I would therefore advise the novice to carefully go over all the adjusting screws, firmly tighten every jamb nut, and to be sure that no adjustment has been altered. It is best to apply the line after everything has been securely fastened. If this is done there is no excuse for the machine getting out of alignment.

A very satisfactory arrangement of guides consists of the non-friction with chilled steel jaws for a top guide and for a bottom guide just the ordinary with end wood for jaws and a chilled steel plate for the back thrust. This should be so set that the upper end reaches well up to the under side of the table, and care should be taken that the back of the saw has a bearing the full extent of the plate. My chief objection to the non-friction guide for a lower guide is that the support for the back of the saw is too far below the table.

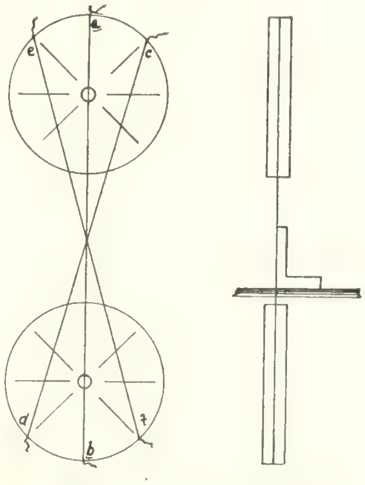


Fig. 2 Fig. 1
Saw should be square with table.

With an arrangement of guides as above it is not necessary to alter the lower guide when changing to a different width of saw. Simply release the top guide clear of the saw and by turning the wheels by hand the saw will adjust itself to the bottom guide. It is then a simple matter to set the top guide accordingly. The only time it is necessary to alter the lower guide is when the operator is desirous of changing the position of the saw on the wheels, which should be done frequently to guard against wearing creases in the rubbers from the set in the teeth.

The cleaning of the brushes and vessels in which varnish or oil paint has been dried is usually done with soda solution. This frequently spoils the brushes and the process is rather dirty. A much more suitable remedy is amyl acetate which, if poured over the paint brush, dissolves the varnish or hardened paint almost immediately.

Efficiency in the Sanding Room

The First of a Series of Articles Touching on the Sanding Cost Problem Confronting Manufacturers To-day. The Author Deals with the Necessity of the Judicious Distribution of Work to the Machine Best Adapted to do it in Order to Accomplish Economical Sanding.

Specially Contributed by H. H. Allen.

IN the past few years the old world has been rudely jostled from the rut it followed placidly for ages. Efficiency has become the universal watchword. In every line of commercial endeavor this movement has been and is being felt. It is particularly manifest in certain branches of woodworking.

To touch on the problem of efficiency in the sanding room, or how quality sanding may be obtained at lowest possible cost, it is necessary first to review the various mechanical methods of sanding afforded manufacturers who have sanding to do.

The roll-feed drum sander naturally comes first, for this type of mechanical sander represents the first attempt of inventors to devise a machine to mechanically sand plain, straight surfaces that, until the advent of sanding machines, were necessarily sanded by hand.

Origin of the Drum Sander

The first drum sander was designed and built in 1877 by two men engaged in the manufacture of burial cases in a little Wisconsin town. These men realized that hand sanding the various pieces that entered into the construction of their product was a slow and decidedly expensive way of getting results. Why could not a machine be devised to perform much of the work—especially on the plain surfaces, such as coffin sides? These two men asked themselves that question and then decided that it could be done. They forthwith set about the construction of a machine to do the work.

Of course the first sanding machine was a crude affair, as compared with the sanding machines of today, not only in design but in construction. The facilities afforded mechanics in those days were not approached by those afforded present-day mechanics. But the principle on which the machine worked was all right. Stock was fed into and out of the machine by power-driven rolls, and passed over a fast revolving drum covered with the desired grade of paper. The same principle, only in a much higher state of development, is followed on all roll-feed drum sanders of the present day.

The first sanders built were really only wood polishers, as they employed but one drum carrying very fine paper. A second attempt was made with a two-drum machine, which would permit of the first drum being covered with coarser paper to do considerable cutting, the latter drum to do the polishing. This worked out so satisfactorily that in the course of time the three-drum sander made its appearance. The standard drum sanding machine of present times is built with three drums: the first drum covered with very coarse grit to do all the cutting; the second drum prepared and adjusted to remove the scratches of the first drum; and the last drum doing nothing but polishing.

At least that is the plan on which a multiple drum sanding machine should operate. However, it frequently happens that in the hands of an inexperienced or careless operator this plan is not adhered to closely, and trouble in the sanding results. This part of "Efficiency in the Sanding Room" will be touched on by the writer in a later article.

The roll-feed multiple drum sanders built to-day represent vast improvement in design, construction and operation, over those first produced in the little Wisconsin burial case factory. They are capable of very fine work, in large quantities, and will endure years of hard service with but little depreciation. No sanding machine, any more than any other piece of machinery, will survive consistent neglect, however. The better care given it the longer it will last and the better work it will produce. The sander must be properly oiled and adjusted, and the grade of paper used on the drums must be in accordance with the nature of the stock to be sanded and the quality of finish desired.

For years the roll-feed drum sander represented the only mechanical means of doing sanding afforded manufacturers. But this machine, though highly efficient on certain kinds of work, could not be used advantageously on others. It would sand long, wide stock most satisfactorily. But small, short and narrow stock could not be sanded on the machine advantageously, if at all.

The reason for this is clear. Stock is fed through the machine by solid rolls, provided with spring tension, and power driven. When it comes to feeding stock shorter than the distance between the centres of the rolls, the stock will pass the first roll, then stand still in the machine. If it doesn't stand still it will be jerked about by the action of the drum, which is most likely to cause trouble, and possibly may permanently injure the drums.

The Belt Sander Idea

Some manufacturers, who realized how desirous it would be to extend the advantages the machine was giving on their long, wide stock to their short pieces, tried feeding short pieces butted, with short-stock attachments in the way of hold-downs between the rolls. This never worked satisfactorily. More frequently than an economical view of the method employed would permit, stock would get caught in the machine and result in paper, and often felt, being torn from the drums. One or two costly accidents such as this occuring in a month more than counterbalanced any advantage derived from feeding short stock in this way. Gradually the practice gained less in favor, and diminished almost entirely when the "belt sander" idea was offered manufacturers as a practical means of sanding the classes of stock that their roll-feed drum sanders would not handle advantageously.

Another disadvantage that users of the roll-feed type of sander felt keenly, was the inability of the machine to sand long narrow stock and obtain anywhere near the full actual capacity of the machine. Unless the strips to be sanded were very carefully sized only three or four would feed at the same time. This was because the infeeding top roll would be lifted by a thick piece, thereby removing all traction from thinner stock until the thicker piece had passed the first roll.

The sectional in-feed top roll was offered as a substitute for the solid in-feed roll hitherto used, and much actual value in the way of increased machine capacity accrued from its use. But the sectional roll cannot be used in every instance, as it has a tendency to chip or break over the edges of the stock being sanded, a condition not permissible in the majority of sanding rooms. Yet some of the sectional sander rolls in use are designed to minimize this fault.

It would seem that the early users of roll-feed drum sanding machines would have attempted the solution of the problem by removing the cause—careless and inaccurate work on the surfacers. But evidently the matter of accurately sizing stock to be sanded, to facilitate the work of the sander, is a proposition that in an earlier day received as little attention as now.

When the belt sander was offered manufacturers, its ability to operate on all classes of work and particularly on stock the roll-feed drum sander would not handle, gained for it immediate favor. This machine is used largely to-day and affords the only means of mechanically sanding many of the curved and odd-shaped pieces with which the average furniture and other woodworking manufacturer works. Its field has been largely curtailed, however, by the new type of sanding machine now being offered manufacturers. It carries three drums, as does the standard roll-feed machine, but has a rubber-studded bed made endless, which provides the feeding method. The rubber bed takes care of slight variation in thickness of stock. This type of machine represents the very latest sanding small flatstock and narrow stock in enormous quantities. It should therefore receive serious consideration by manufacturers who have large quantities of small stock to sand.

The three types of sanders referred to represent the present available methods afforded manufacturers. Of course these sanders may be obtained in various forms, particularly the belt machines, which are built by various concerns and in many different forms. many of them very complicated. The principle employed, however, is the same. It consists of a belt with one side prepared to carry sandpaper running over a series of pulleys, in close proximity to the work to be sanded, and brought to bear against it automatically or by effort of the operator.

Economy in the Sanding Room

The manufacturer who is seeking the most economical method of sanding his stock must consider all three types of sanders. The roll-feed drum sander should be used only on the class of work it will sand well and permit the use of the full capacity of the machine. Wherever possible all the narrow, small flat stock and odd-shaped pieces should be sanded on the rotary bed sander.

The belt sander should be employed only on such stock that may not be sanded more economically on the drum machines. It is unquestioned that either type of drum machine will operate more advantageously on work to which it is adapted than will the belt sander on the same work. The truth of this will be realized when we consider that the operator on the belt machine handles every piece separately, giving it his fixed attention until the operation is completed. Whereas on the drum machines the workman is required only to feed stock and take it away from the machine, which in the average case usually keeps two men continuously active. The sanding itself is accomplished by the machine, in direct opposition to the method followed on the belt sander, where the results obtained will work out in direct ratio to the ability of the operator. Yet there is a large field open to the belt sanding machines that cannot be approached by the drum machines.

Some firms will be able to use two types of sanders advantageously, such as novelty shops who will find the endless bed type of sander and the belt machine adequate on their work. A door manufacturer will not be likely to have any particular use for an endless bed machine, unless he builds a line of small doors as well as large ones, in which case the endless bed machine will prove invaluable on the small parts such as panels, etc.

Many door manufacturers employ belt sanders for giving their products a final polish. However, this appears to the writer as unnecessary from an economical standpoint, as it is evident, by inspection of many door manufacturing establishments where stock is sent direct from the drum machines to the finishing room, that a very fine finish can be obtained on drum machines if operators will use the necessary care in making adjustments, using the proper grade of paper, and the correct rate of feed. Many of the most prominent door manufacturing concerns in the country employ only one type of sanding machine on their work —the roll-feed drum sander.

Firms who have spent large sums of money in putting their sanding rooms on a sound, efficient basis, find that the only way to do it is to use the roll feed—endless bed—belt sander combination. Long wide stock is sanded on the roll-feed machine; all the other stock possible, small, narrow and odd-shaped flat pieces, goes to the endless bed. The remainder of the stock, which neither of the drum machines will handle, goes to the belts.

There is no denying that this arrangement offers the only sound basis on which a system may be built up that will make for economical sanding, using the conditions, of course, of the average factory employing sanding equipment as a foundation on which to base calculations.

The total value of the output of planing mills in the Province of Saskatchewan has increased considerably in the last few years, according to the third annual report issued recently by the Bureau of Labor, Regina. This question was the subject of a special enquiry by the Bureau with the result that nearly all the mill men interviewed stated that the class of building in course of erection in the province was gradually improving and as a result the mills were turning out a much higher class of work, which necessitated the use of the better and more expensive grades of wood. While the total value of work turned out last year did not reach that of 1912 yet it was of greater value, which fact is plainly indicated in the tables set out in the report. From these tables we gather that the number of woodworking establishments in the province have increased from sixteen in 1911 to thirty-six in 1913. The capital, including plant, involved $514,433 in 1911, an amount which had increased to $1,599,048 last year. The gross value of the product last year was $2,445,504, as against $1 391,648 in the year of 1911.

If you would be a real success at machine operating you must learn the difference between keeping a machine in good order and doing useless tinkering on it.

The Causes, Consequences and Testing of Glue Foam

FOAM in glue is caused principally by the presence of mucin, a substance existing in the raw glue stock (but removable by proper washing) and by soaps formed in the process of manufacture by overliming, writes E. S. Smith, in Wood Craft.

Glues possessing foaming properties to a marked degree are a source of considerable loss and annoyance to the consumer. A highly foaming glue is an indication of faulty manufacturing methods, resulting in an inferior product.

Viscosity, Foam and Glue Value

Unfortunately the same causes that produce foam also increase the apparent viscosity of the glue to a misleading extent, with the result that the latter test in this case becomes of little use in determining the glue value.

High foaming properties are especially objectionable in glues that are applied to the work by mechanical means. Here the roll or brush agitates the glue solution to such an extent that a froth—a mixture of glue and air—is the result, with a consequent reduction in the binding power of the glue.

It is quite possible to test glue for foam by means of an eggbeater or similar whipping device applied to a melted sample, but it is difficult to gage the amount of foam with an accuracy sufficient to predetermine the action of this glue on a mechanical spreader. The temperature at which the test is made is also a very important factor in the quantity of foam produced. In order to control this matter, the writer devised the apparatus described herewith for laboratory testing.

The results obtained by the use of this device have invariably been confirmed in practice—every glue showing a high foam on the tester has shown the same property on the spreader and, conversely, a glue working well on the spreader always shows a low foam on the laboratory test.

Permissible Foam in Practice

All glues foam to a certain extent on this device, but a few tests will determine the maximum foam permissible for practical use. Once this limit has been established it is a very simple matter to predetermine the action of a certain lot of glue as regards foaming on the spreading machine, since the tester gives an exact measure of the foaming properties. The results, with a little practice, can be compared directly with those obtained in actual use.

As before noted, the temperature at which the tests are made has a very important bearing on the foam produced. To secure comparable results it is absolutely necessary that the glues under test be kept at a nearly fixed temperature. In the device about to be described this is accomplished by the use of a water-jacket in which the glue sample is heated and maintained at practically one temperature throughout the test. Agitation of glues without this precaution is an ideal method of cooling them with a consequent variation in the amount of foam produced—an effect diametrically opposite to that desired.

The essential feature of the tester lies in the water-jacket shown in Fig. 1. This consists of a copper tube A, ¾ inch in diameter and 13 inches long. It may be made of light sheet copper soldered along the seam. One-half inch from each end is soldered a copper washer B, 1½ inches outside diameter.

A piece of copper tubing 12 inches long with an inside diameter of 1½ inches is slipped over the smaller tube and washers and soldered to them. This outer tube may be made of sheet metal if rolled tubing is not available. Drill a small hole in this tube, fill space between the tubes with water and seal the hole with solder.

From heavy glass tubing ¾ inch outside diameter, cut two or three 14-inch lengths. These glass tubes should make a nice sliding fit in the ¾-inch tube of the jacket. To this end the diameter of the copper tube may be modified from the dimensions given to make a good fit around the glass tubing.

Tube and Thermometer

Close one end of the latter with a rubber stopper and scratch a mark on the glass about 6 inches from this closed end. Provide two rubber stoppers for the other end of this tube, one with a hole in it to take the thermometer C and the other solid to replace this while the tube is being shaken.

The shaking mechanism may be made in several forms, the one shown in Figs. 2 and 3 being, perhaps as simple as any. It consists of a wooden carrier E, preferably of maple, provided with four lugs at F, bored to make a sliding fit on the two steel rods G.

Water Jacket and Carrier

A recess, semicircular in section, is made in the carrier as shown in Fig. 4, to hold the water-jacket D and the projecting ends of the glass tube and its rubber stoppers. This jacket must be held firmly in position in the carrier, end-play especially being avoided. This may be accomplished by means of two suitably mounted wood buttons (not shown in sketch) bearing on each end of the copper tube.

The carrier should have a longitudinal motion of about 7 inches on the guides G, which are mounted on the baseboard H. This board may be conveniently attached to the end of a bench at an angle of 45 degrees, as shown in Fig. 3, by means of brackets. The carrier E is connected to a heavy flywheel J by the steel arm K pivoted on a pin L passing through the edge of the carrier and to the pin M located 3 inches from the center of the flywheel shaft. The latter is driven by the pulley N at a rate of approximately 400 revolutions per minute.

Foam, Jelly and Viscosity Tests

The test for foam may be conveniently made in conjunction with the jelly and viscosity tests. When the glue is properly melted and the temperature of the water in which it is being heated is about 60 degrees C, transfer the hot glue to the glass tube, filling same exactly to the mark previously mentioned. This requires about 20 cubic centimeters.

Close the end of the glass tube with the rubber stopper carrying the thermometer and slip it into the copper jacket. The latter should have been previously heated on a tripod over a Bunsen flame to a temperature just uncomfortable to the touch.

Place the jacket and the glue within over the burner (turned quite low) and heat slowly until the thermometer in the glue reads just 60 degrees C. This requires but a few minutes, providing the jacket has been previously heated to nearly that temperature. A little practice will enable one to attain the proper degree of heat in a very short time.

Then transfer the jacket and tube to the carrier and fasten securely. Start the machine and shake for exactly one minute. As quickly as possible after the machine stops remove the glass tube from the jacket and, by means of a small rule and holding the tube vertically, measure the distance from the mark on the glass to the top of the froth on the glue. A rule with a millimeter scale is more convenient in this connection, since fractions are thereby avoided.

The column of foam on different glues will vary from 10 to 100 millimeters or even higher. To compare the results with those found in the actual use of the glue in the shop it is only necessary to secure a sample of a glue that shows the maximum allowable amount of foam on the spreading machine and test this.

Let us suppose it shows, say, 40 millimeters of foam. Then in future any glue showing more than 40 millimeters of foam in the tester may be safely condemned as undesirable while those showing less than that amount will give no foaming troubles in the practical application.

No hard and fast mark can be set as to the foam limit since this will vary with different types of spreaders. Very few tests, however, will be necessary to enable one to determine in advance just how a glue is going to act on the spreader. Once this relation of the test figures to the action of the glue in practice is established foam troubles may be readily avoided by preliminary tests.

An extra water-jacket and glass tube will prove convenient if many samples are to be tested at one time. In this way one glue may be heating to the proper temperature while the other is in the shaker or the glass tube which is being washed out.

As to the temperature at which the tests are to be made, the writer has found 60 degrees C convenient, but other temperatures may be adopted if desired. It should approximate the temperature at which the glues are worked. Once decided upon, however, this temperature should always be used if comparative results are desired. A glue made up at the same strength will show the same foam figure each time if run at the same concentration and temperature, providing the solution has been freshly made and has not been allowed to jelly.

The accompanying table of results will show the effect on the foam of temperature changes and also the different figures obtained by remelting jellies.

Sample	I	II	III	IV
2	31 mm.	32 mm.	18 mm.	12 mm.
3	54 mm.	53 mm.	27 mm.	30 mm.
4	25 mm.	25 mm.	22 mm.	34 mm.
5	22 mm.	22 mm.	23 mm.	15 mm.
6	29 mm.	29 mm.	16 mm.	16 mm.
7	32 mm.	33 mm.	29 mm.	32 mm.

Columns I and II give the correct foam figures for the freshly melted samples at 60 degrees, run in duplicate tests.

Column III shows the figures obtained from these samples after same had been set and then been remelted and heated to 60 degrees.

Column IV shows the same remelted samples but run at 30 degrees instead of 60 degrees.

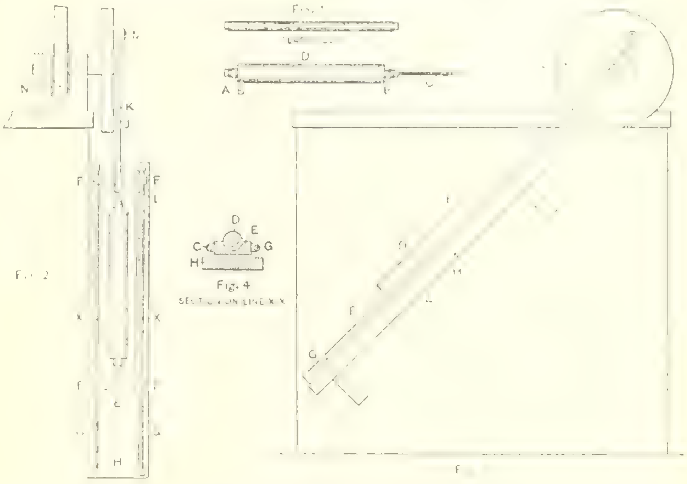
From these results in the table it is apparent that duplicating results are obtainable if the samples are freshly made up and a constant temperature used on all. The effects of remelting and change of temperature are neither constant nor can they be predicted. The foam found on remelted samples is always less than on freshly made solutions, but the change in temperature increases the foam in some cases and in others seems to cause the opposite effect.

Foaming and the Shop Methods

But since it is entirely possible to secure uniform and closely agreeing results by the use of properly prepared samples and uniform temperature, this erratic behavior of remelted glues becomes of little practical importance.

It must not be supposed that the cause of foaming on the spreader always lies in the quality of the glue. Faulty manufacturing methods in the glue factory may result in a foaming product, and in such case is detectable in the laboratory tests before the glue is used.

But should a glue pass this test and yet be found to foam badly on the spreader it is obviously due to some fault in the shop methods. Highly foaming properties may develop in an almost non-foaming glue by too protracted cooking or in glues that have soured. A relatively small amount of sour glue may so contaminate a lot of fresh glue that excessive foaming will result.



Device designed to determine the action of glue on mechanical spreaders.

The writer recalls one instance in which a carpet covered spreader was used on panel work. Foam troubles developed to such an extent that the shop was shut down for lack of material. Investigation failed to show the cause of the trouble. The glue had tested sufficiently free from foam, the cooker and pans were thoroughly cleaned, but still the product foamed.

As a last resort, the carpet on the roll was removed with an excellent exhibition of putrefying glue as a result. Upon resuming operations with a new carpet covering no trouble whatsoever was experienced.

Thus a laboratory foam test will enable the consumer to determine if a glue's foaming is due to lack of care in its preparation or to his own methods of handling it. The fault must be with one or the other. A test such as the one described affords a very simple means of determining where that fault lies.

A cabinet, to be presented to the Missouri Historical Society by the St. Louis furniture board of trade, will be built of wood from a tree that a committee of the board fell with their own hands in Forest Park. The cabinet is to be sealed, and is not to be opened until within ninety days after the two hundredth anniversary of the founding of the city, 2004.

The Application of Electric Drive to a British Columbia Planing Mill

IN British Columbia, where the lumbering industry is of paramount importance, the application of electric drive to lumber mills is engaging the close attention of mill owners. The most recent instance in this province of the adoption of electric drive for this purpose is the McLelan Lumber Company's new mill, situated at Ladner, about twelve miles due south of Vancouver, which commenced cutting last March. The plant, which has a daily capacity of about 125,000 feet, and provides employment for a mill crew of 100 men on an average, occupies a site covering ten acres on the south arm of the Fraser River. Steam as well as electric power is utilized, the planing mill being operated by electric drive, while the sawmill is driven by steam.

The sawmill power house is a cement structure 40 x 48 feet in size. It contains a battery of three 72-in. x 18 ft. return tubular boilers, each carrying 160 lbs. pressure. The boilers, which were manufactured by the Vulcan Iron Works, New Westminster, B.C., have "Dutch Oven" settings and are fed automatically from overhead.

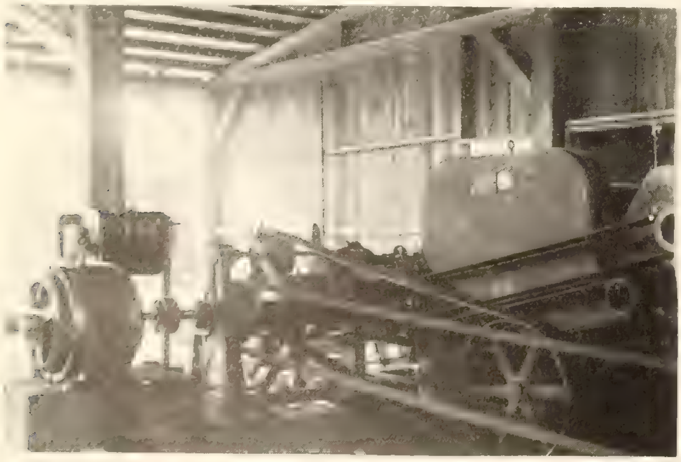
The engine room adjoining, built of cement and brick, is 44 x 40 ft. in size. In it is a pair of Lane & Bodley Company twin engines, 17 x 24-in., capable of developing 600 h.p.; also a Worthington pump 10 x 6 x 10-in., capacity 500 gallons per minute, which is being used at present for fire protection.

The planing mill is 40 x 60 ft. in size, with cupola roof, there being two 24-ft. overloading additions on the north and south sides; on the east side is the grinding room, 16 x 40 ft. The equipment of machines comprises one Berlin No. 91 fast feed planer; one Berlin No. 108 inside moulder; one Berlin self-feed ripsaw; one 60-in. Mershon resaw; one 48-in. three-drum sander; and four swing cut-off saws. All machines in the planing mill are driven by individual motors varying in size from 1 h.p. to 50 h.p., three of the motors being direct connected to the driven machines. Electric current is furnished by the Vancouver Power Company, a subsidiary concern of the B. C. Electric Railway Company, the pressure being 220 volts, 3-phase at 60 cycles. The blow-piping system serving the machines was installed by Feix Company, Vancouver. It collects the shavings and sawdust from each and delivers it through a long pipe to feed the boilers in the sawmill power house. The system is equipped with a double 55-in. Sheldon fan, electrically-driven, and installed in such a way as to work very economically.

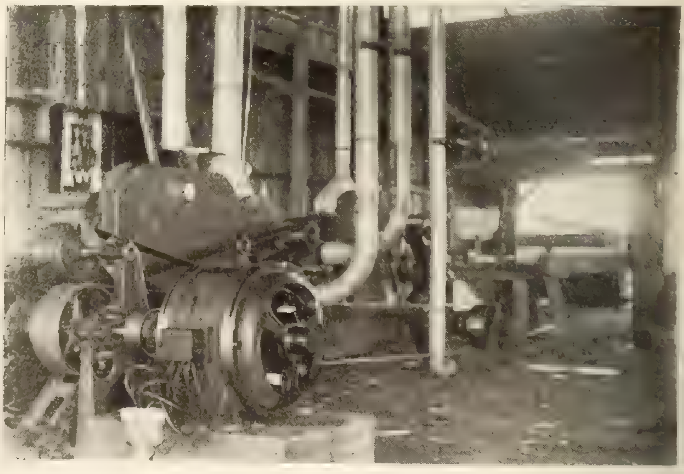
Lumber cutting being fairly intermittent and varying in proportion to the size of the cut, a problem of interest to the mill owners is—after ascertaining the size in B.h.p. of the motor required—to find a motor having a long range of efficiency around the normal load of the motor. In such a choice there is much money to be saved. The accompanying set of curves for a 40 B.h.p. motor at the McLelan Company's mill shows the efficiency between half load and full load to be nearly a straight line, while the efficiency at quarter load is 79 per cent. and at 25 per cent. overload 84 per cent. At the same time this set of curves demonstrates the fact that a motor must not be overloaded to any great extent if the lumber to be cut is to be a paying proposition. Very often one or more overloaded motors eat up the cost of the purchase of larger motors, the mill owner not being aware of the actual loss, as the current bill is spread over a number of motors and a number of cuts of varying sizes.

Another feature of the electric installation at Ladner is the "fool proof" starting devices. The starting handle cannot be thrown into the "running" position without first engaging with the "start" position. A time lag or slow motion device compels the operator to hold the handle in the "start" position for the predetermined length of time; any premature attempt to engage with the "running" position merely brings the handle to the "off" position. The starters are also fitted with "no-volt" and "overload" circuit-breakers which bring the starting handle to the "off" position in cases of failure of supply or overload. The overload breakers being in circuit in the "running" position only, can be set at a load to protect the motor and at the same time save fuses.

The smaller motors from 25 B.h.p. down are fitted with ball-bearings and require no lubrication for per-



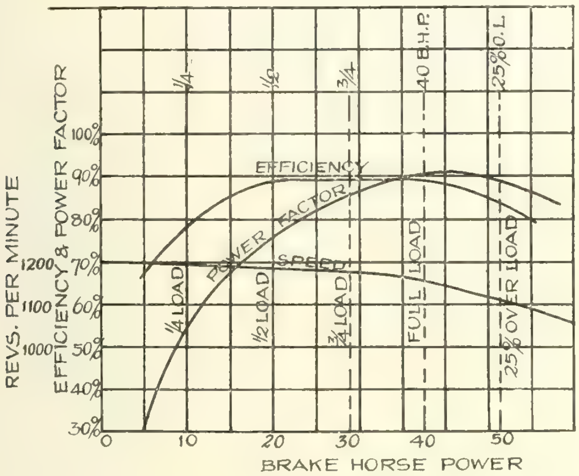
Direct driven machine in plant of McLelan Lumber Gompany, Lander, B. C. showing motor and starter.



Another view of direct connected machine in McLelan Lumber Company's plant, Lander, B. C.

iods of twelve months and upwards. The standard of temperature adopted is 72 deg. Fah. (40 deg. Cent.) when running continuously at full load.

The motors in the planing mill of the McLelan Lumber Company were supplied and connected by Messrs. P. E. Harris & Company, Limited, Vancouver, who are the agents in British Columbia for the makers, Messrs. Harding, Churton & Company, Limited, Leeds, Eng. The electrical department of Messrs. P. E. Harris & Company, Limited, is under the management of Mr. W. W. Fraser.



High motor efficiency over wide range.

How to Make a Water-tight Box

By Warren G. Douglas

An old book states, as "the first rule of carpentry," that "all pieces of wood should be so disposed that shrinking and swelling will least affect the joints." While this is true enough, all the years before and since that book was written have not served to teach us how this may always best be done. While it is a rule so axiomatic as to have become almost automatic with most of us, conditions are so variable as to make its application call for continuous study and watchfulness. On most of the work which is done with correctly seasoned and immediately painted lumber the strict observance of the rule is comparatively non-essential; but on work which is to be exposed to changing moisture conditions it is necessary to observe it carefully.

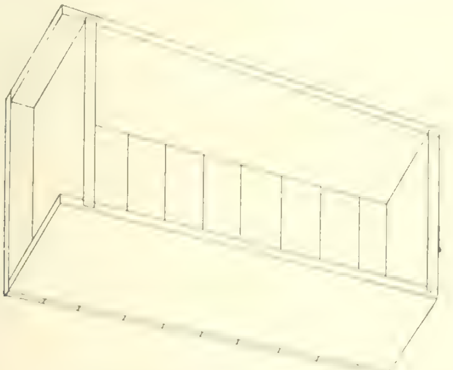


Fig. 1.—Simplest form of water-tight construction.

One of the most typical and troublesome problems connected with its application arises in the making of a water-tight box, wherein perfection (never yet attained) lies in having the joints remain perfect while the wood swells and shrinks to the utmost. Where it can be rigidly held against expansion, as in a tub or barrel, this is a comparatively simple matter; but in the case of a rectangular box such holding is generally impracticable and the problem becomes that of making the wood hold against itself in so far as is possible.

The well-understood fact that when a piece is inserted in a gain or groove at right angles with the grain of another, its tendency is to swell tight, tends to an overestimate of the value of tongues and grooves in general. The fact is, however, that where water-tight construction is desired a tongue and groove joint lengthwise the wood is far from being of first importance—is quite often, in fact, most undesirable. Nor will the good woodworker place too much dependence in paint and putty. It is the intent of this article to consider only methods of guarding against the swelling action of water, the matter of its pressure being one distinct in itself, which calls for consideration only in case of the larger tanks.

The simplest form of water-tight construction is that shown in Fig. 1, it being essentially that commonly used in the construction of wooden sinks and the like. In this case the bottom is held on by nails or screws and is put crosswise because it may thus be securely held. Two different ways of joining the ends to the sides are shown, that on the left being stronger and in every way preferable except in cases where the projecting ends of the sides would be objectionable.

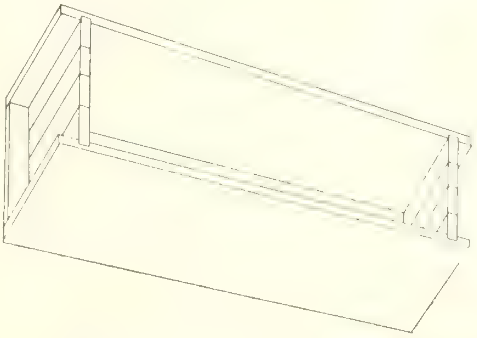


Fig. 2.—Where more than one width of lumber is used.

It is well, before nailing the bottom on such a job as this, to compress a narrow strip of the wood along the centre of the lower edges of the sides and ends, by hammering it down, and then to plane off the whole edge to an even surface. This compressed wood, expanding with moisture, will be pressed tightly against the bottom boards sufficiently to make the joint water-tight, but will not seriously tend to push the nails or screws out.

In the case of a higher box, where more than one width of lumber must be used for the sides or ends, and where bolts, however undesirable, are a practical necessity, a slightly different method of structure must be adopted, as illustrated in Fig. 2. In this form of construction the bottom and ends are so placed, relatively, that they will swell and shrink in the same direction and must be held together, while the sides are held against them by transverse bolts, which will preferably pass through heavy wooden yokes or cross-pieces on the outside. With this arrangement the swelling and shrinking of the sides will have comparatively little effect on the water-tightness of the job, and they need be, comparatively speaking, but slightly secured; and, unless the length and height are quite considerable, no bolts other than the transverse ones will be needed.—The Wood-Worker.

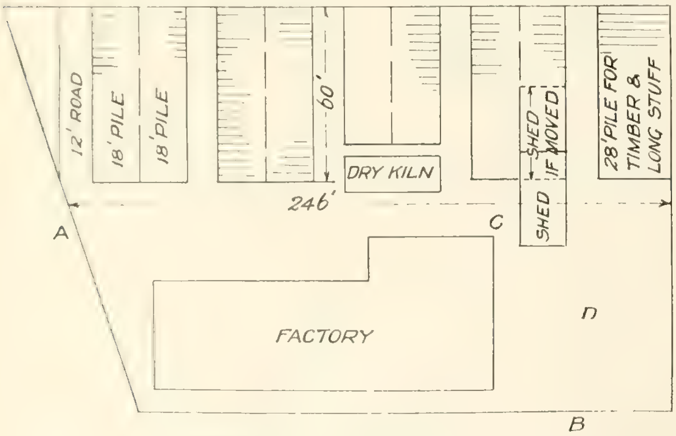
QUESTION BOX

A Practical Department of Reference for the Practical Man

Lay-out for Lumber Camp

Q. "Will you kindly give us some information as to what you would consider the most suitable lay-out for our lumber yard, as per enclosed sketch. As you notice, we have a lumber shed already built, but if you deem it best in another position it could be moved. We want it laid off in such a way as to stand us good when we wish to make further additions to our shed, and to make way for further supplies of lumber. We would want our lumber yard laid out so that we could carry $15,000 stock. At present it will not run as much, but we would like to have it laid out to look after future requirements."

A.—Notwithstanding the fact that the information you have given is very meagre, we venture to suggest the following lay-out for your lumber yard, which should prove satisfactory. We are assuming that entrance to your property may be secured at A and B, but if only at one of these, the shed would have to be moved back to the position of the dotted lines, and a passage provided at C. According to this arrangement you have two hundred and sixty feet of pile frontage and sixty feet depth, which laid out in double piles as shown—eighteen feet wide with a twelve-foot passage—will permit you to store about 700,000 feet, which at the minimum price of twenty dollars per thousand feet, will allow the fifteen-thousand-dollar stock you desire. Of course, the higher in price the lumber is, the higher will be the value of your stock for the same space. You have here an opportunity to extend your storage sheds to cover one of the piling spaces, as may be needed, and your dry kiln may also be extended along the sixty-foot dimension, and you have besides the space at D left to extend your mill after the war. If for any reason the above should not be feasible, owing to our not having full information, we shall be glad on receipt of a scale drawing of the property with the exact location of kiln, shed, entrances, railroad facilities, etc., to submit something more detailed. Meanwhile, we trust that the above will be of some assistance to you.



Suggested lay-out for lumber yard.

Selecting a Knife Grinder

Q.—"What form and make of knife grinder would you recommend as best suited to the requirements of a medium-sized planing mill?"

A.—Of the many factors to be taken into consideration in selecting a machine of this kind, there are only three which the ordinary mill can afford to consider, namely price, adaptability and cost of operation. Strange as it may seem, there are very few machines which meet all these requirements, so that once the requirements are known the selection is not a difficult matter. Ordinary planing and matching machines require two forms of cutting edges, namely, the concave ground edge and the flat ground edge; the former for light, slow work, and the latter for fast, hard work in knotty lumber which might be inclined to knock the fine cutting edge of the concave knife. Consequently, a machine to be of general use in the planing mill, should be able to produce both kinds of edges, and the small cup wheel grinder is the only machine on the market which will do this work. They may be had with full automatic attachments which, by permitting the filer to attend to other work while grinding knives, reduces the cost of labor to the minimum. They are very small and compact, taking up very little floor space in the grinding room (which is seldom large enough in any mill), and last but not least, the price is low. You will find them advertised in any woodworking journal, and the manufacturers will probably be glad to furnish any further information required.

Testing Lumber from Dry Kiln

Q.—"What is the simplest way to test lumber from a dry kiln to see if it is in suitable condition for use?"

A.—Generally speaking the condition of the lumber is determined by ascertaining the percentage of moisture it contains, either by weighing before and after drying, or by means of instruments which are included in the equipment of all first-class kilns. However, it generally turns out that after using the instruments for a time, the kiln attendant lays it to one side and tries a simpler and perhaps as reliable a means. He takes a board from the top of the carload to be tested, cuts it in two in the middle and cuts out a piece, say one-inch wide, which he carefully calipers for length, width and thickness. He then lays it on the engine cylinder or some other hot place for an hour or so, then calipers it again. It will have shrunk a little, the degree being determined by the amount of moisture present. Having found out what the bone dry measure is, he takes it into the shop and leaves it exposed for a time to the air in which it will be worked up and finished. Here it will change again in size, but the variation in properly dried stock is so small that improperly or partially dried stock is detected at once, either by excessive shrinkage or swelling, and the experience of the man in charge of this branch is generally a pretty good guide. Lumber from any dry kiln should be allowed to stand in the air for several hours before using. In fact the longer it stands in the air and tempers itself after drying, the easier it will work and the more permanent will be its dimensions, which is of the greatest importance in most lines of work.

Concerning the Gasoline Truck

Q.—"We have a gasoline truck which we use in our lumber business, and must say that we are somewhat puzzled to know how to buy our gasoline so as to get what we pay for. Can you tell us if there is any test we can apply."

A.—There are tests for the quality of gasoline, the most reliable of which is the Distillation Test, which requires the services of a chemist. However this is not exactly what you require. What you want to know is how far a certain grade of gasoline will carry a given load, so the simplest thing to do is to find out. Make a small tank which will sit on the seat beside the driver, with the bottom built so as to drain dry. Connect it with the carburetter by a piece of rubber tubing, after disconnecting the usual supply pipe. Run the engine until it stops for want of fuel, then put a certain quantity of your test fuel, say a quart, in the tank and run the truck empty over a level road as far as it will go. Then put in another sample and run back over the same road, noting the distance covered in each case. When you have tested four or five samples you will be in a position to know what you are buying. This test has but one draw-back, that the quantity of gasoline consumed varies slightly with the condition of the atmosphere, the condition of the engine, the skill of the driver and the condition of the road. So if at any future time you desire to recheck your supply it will be necessary to make all the tests over again, so as to have them again under the same conditions.

Carrying Swage on Band Saw

Q.—"How much swage should be carried on five and six-inch eighteen-gauge band saws in pine, spruce, etc.?"

A.—The proper amount of swage can only be determined by the men on the job, for conditions vary. You should carry as little swage as will clear the saw; never more than four gauges and seldom less than two gauges. Give them just enough to insure a clearance in the particular wood you are cutting. Soft, stringy or wet woods require more swage than hard and dry woods.

A Way Out of the Rut

Q.—"I am a man doing all-round work in a sash and door factory and know my work well, having been at it for almost ten years. It seemed to me when I started in that by close attention I would be able to work into the position of a foreman or more, but now I am afraid of getting into a rut. Can you give me any suggestion that will help me to find a way out"

A.—There are many like you who never get out of the rut, because, while they had the knowledge and the desire they lacked the will or courage to face the hardships of a climb. It must be remembered that the man on the ladder is the one who feels the wind, and it must also be remembered that one never reaches the top and is never free from the danger of a fall, which danger he would not risk were he closer to the ground. However, the climb and the rewards along the way make the climb worth while, and perhaps the following may give you a start: In the first place you have to attract the attention of your superior, and convince him that you have brains as well as hands. There are doubtless things about the routine of the work which you know and have known can be done cheaper or better. Suggest a remedy. Watch for opportunities to take responsibility and show your good judgment. Prove that you are reliable and safe. You will get your start all right, but bear in mind that it is no small job you have tackled, and that if you are going to get ahead you will require to have your full mental and physical faculties undimmed by any of the results of dissipation in any form. Don't get discouraged. Keep at it.

Questions for the Manager and Foreman

IN an interesting address on the subject of Management, delivered by Frederick A. Waldron, Industrial Engineer, before the New Jersey Association of Manufacturers, a number of straight questions were asked of the plant manager. These questions are not without application in the woodworking industry and so we extract them below:

Are you keeping pace with your workmen?

Do you realize that the libraries, reading rooms, and places for technical instruction are filled with your workmen in leisure hours?

Do you know that in your factory are probably workmen better read, better posted on science, literature, religion, philosophy, business methods, modern shop organizations, than you or your immediate subordinates are?

Are you progressing in the same ratio as they?

Are you giving the service you demand?

Are you giving the workmen proper materials with which to turn out the work?

Are you giving them the facilities for properly and economically producing your goods?

Are you giving them surroundings conducive to good health and longevity?

Are you taking the interest, the proper interest, that you should, in the forward movement toward the uplift of the industrial code.

Are you managing yourselves as you would your shop or your business?

Are you conducting yourselves so that your help and your customers are looking up to you and swearing by and not at you?

Are you purchasing and producing a line of goods which will just get by and sell, or are you putting your head and heart into your work with the idea of making the very best that it is possible to make?

Are you tied up in the character and quality of the product which you are turning out, or have you only in view the almighty dollar?

It has been my observation, after having had the privilege of examining a number of plants, that there are fifty reasons at least why a workman should not turn out a full day's work, all of which are beyond his control and his endeavor. Most of these fifty reasons directly affect the character and quality of the output. Have you taken the pains to investigate why these occur, from a purely commercial viewpoint, or do you take the word of some of your subordinates and let it go at that?

Are you imparting to your organization the proper humanitarian views by force of example and interest, and are you really giving your workmen a fair chance to produce the character and quality of work which you demand?

Suggestions for Keeping up Mortise Tools

Contributed by L. A. Blake

FOR exacting requirements in the way of sharpening and setting, the bits used in connection with the mortising machines employed in sash and door work, and also to some extent in furniture work, are hard to beat. In reality, the exact cutting angles are just as necessary in the cutters of larger machines, but it is the smallness of the bits that calls for extra care in sharpening, since there is less metal to guide the file and consequently the edges are sooner put out of adjustment. These conditions may be said to apply equally to the chain saw and to the hollow chisel and auger types of mortise cutter. Doing the same work by two totally different mechanical actions, these cutters create a sharpening problem to the newly fledged machine hand that is apt to cause his other troubles to seem quite light by comparison. While once mastered, however, nothing will give him greater pride than to see the quantity and quality of work that his well adjusted bits will turn out. The sharpening time does not represent such a large proportion of the mortising machines working time as it does of the time of some other machines, so it will easily pay to sharpen the bits well when they do require it. A great deal of the success of sharpening these mortise cutters depends on using proper sharpening tools, and this point should always be borne in mind in case there should seem to be any difficulty with the bits.

The chain saw is of course the mortise tool of the present day, and its makers have brought it up to a fine pitch of excellence. What is more, they have also brought out a special grinder for sharpening these chains, so that all that is required to keep the chains in good order as far as the cutting edges are concerned, is to get one of these grinders and use it as directed. If the wood to be worked is mixed hardwood and pine, keep the same degree of hook on the teeth as when new. For softwood only the hook may be kept fairly sharp, but for work in hardwoods it should be reduced slightly. Care should be taken not to grind the hook off too far, or the attempt to mortise with a chain in this condition will overheat it and probably end by springing the guide bar through the excessive side strain imposed upon it. A and B (Fig. 1), illustrate respectively the hooks for hard and soft wood, and the incorrect angle into which it is easy to drift through carelessness. Never attempt to sharpen on the backs of the teeth, and for that reason do not grind the fronts of the teeth so hard as to raise a burr. The fronts may also be touched up with an oil slip between grindings. Should some teeth get ground slightly more than others it is good practice to joint them lightly with a piece of emery. To do this, hold the emery under the lower end of the chain when the machine is running, at the same time resting the hand on the clamp. Then raise the hand slowly, keeping the stone square across the chain.

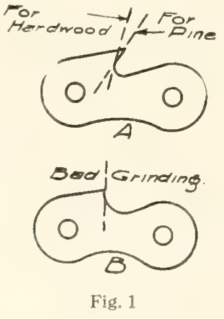


Fig. 1

Keep chains and roller ends of guide bars in a bath of machine oil when not in use, and wash off any adhering gum with coal oil before placing in the tank. If possible the chains and bars should be supported clear of the bottom of the tank so that any gum, etc., loosened by the oil will sink away from the metal altogether. Remove the back plate of the guide bars occasionally and fill the roller bearing with vaseline. When removing this plate use a screw-driver to fit the screws, or they will become so battered that it will be difficult to get them tight enough to stay in while the bar is in use. Lubricate the chain every half hour when in use, and watch carefully for loose link pins or tight links caused by small shavings getting wedged between two links.

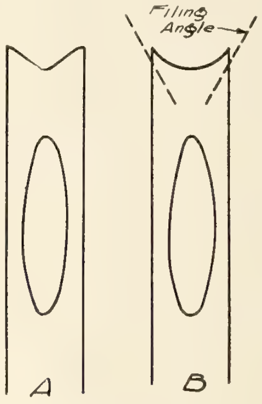


Fig. 2

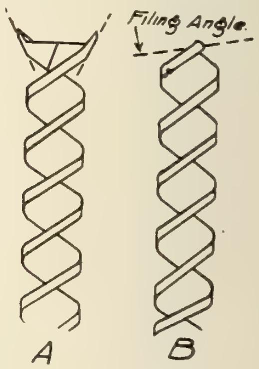


Fig. 3

When the auger is new it will be noticed that the cutting end is enlarged to bore a hole of the same diameter as the size of the chisel with which it is to be used. The chisel must be filed to fit this conical section, although the bit must not be allowed to press against the mouth of the chisel when in operation. Use a small half-pound file for the chisel and file to a circle. Do not run the edge of the file into the corners of the chisel or so as to give the edge the form shown in A (Fig. 2). This method of filing leaves little gaps where shavings can work through without being cut by the inside bit. It is easy to burst a hollow chisel by running it in such a condition that the shavings can accumulate around the revolving bit inside. Never on any account touch the outside of the chisel with either file or oil slip or the chisel will be made like a wedge and will act like one when in use, causing lots of trouble through failure to release the wood after a cut. Dirt sticking around the seat of the chisel is another source of trouble through throwing it out of line.

The revolving bit should only be sharpened as often as necessary. That is unless the firm is rich enough to buy new bits every six weeks or so. The life of a bit is only as long as the enlarged part at the cutting end, and after that is filed away it is impossible to get clean work from it. Therefore be it repeated, go easy on the centre bits. File across at a fairly flat angle as shown in B (Fig. 3), and keep the projecting ears neatly dressed to an equal length. Should a bit become strained and bent, straighten it carefully before using again, as a bit in this condition will bind in the chisel and cause over-heating

The Hardwood Market

GENERAL market conditions in hardwoods have not changed substantially during the last few weeks. Since our last review an entirely new element has entered into the situation. Whether the effect of the European crisis will be felt very acutely by hardwood manufacturers in Canada and the United States is a problem which future developments alone can accurately determine. Prior to the declaration of war there seemed to be a pronounced improvement in the hardwood market, which included both sales and prices. As far as can be judged at present, indications point to continued purchases of about the same proportions, unless unforeseen developments of unusual character intervene. The demand for lumber for rebuilding purposes throughout Mexico is one development which should be viewed with favor by hardwood men. There are said to be many yards of considerable proportions which are placing substantial orders for building lumber to go into the reconstruction of that portion of Mexico which was disturbed as a result of the recent unrest. This is a factor the importance of which will be appreciated by dealers who will be likely to benefit, to some extent at least, thereby.

The furniture and vehicle factories in Canada are apparently buying lumber only in such quantities as are required for immediate use. This would indicate that business is still being done on a conservative basis. As yet there is no reaching forward to buy stock for future use, and notwithstanding this spasmodic demand hardwood manufacturers, as a rule, are holding firm in quoting prices. A fair movement is reported in 1-in. birch, also a small movement in the larger sizes. Elm is also moving to some extent, but in this sphere the market is very quiet.

An interesting and instructive report on market conditions was laid before the Michigan Hardwood Manufacturers' Association at their annual meeting recently. The report, which strikes an optimistic note regarding general trade conditions, discusses the cause of the depression for the past few months. The report has this to say:

"The trouble is not so much overproduction as it is lessened demand, which applies no more to lumber than to other commodities. This tends to cause stocks to accumulate at the mills, and suggests to some the old and futile policy of cutting prices to move stocks. It is the opinion of this committee, after careful study of the figures available, that stocks will not move by reason of price cutting until the low level of prices which prevailed back in 1907 is again reached, or nearly so. Jobbers and consumers to-day are practically bare of stocks and are buying only for their immediate wants, and if the manufacturers recede as far as their 1907 quotations, there are many wholesalers who will speculate and buy the stock, holding it for better times which are bound to come sooner or later. It is apparent to all of us that the increased cost of stumpage and of manufacturing will not permit any such cut as this and would only result in the sacrifice of the justly earned margin upon stocks which are sure to return to their rightful place when general business conditions are back to normal. It is almost a certainty that with the return of usual business activity, this small excess of unsold stock will move quickly and an underproduction will be apparent, and we are confident that if manufacturers will hold firmly to right and proper prices for their stocks, they will move every bit as much as could possibly be moved by any amount of price-cutting, thereby conserving the profit to themselves instead of diverting it into the hands of the speculating jobber. The committee believe that we are already over the worst of the present depression."

The American Lumberman says, "On the whole the hardwood trade of the country seems to be in slightly better form. Furniture manufacturers and other consumers are now allowing orders which have been held up for some time to be delivered. Plain oak is moving fairly well, but is feeling the depressing effect of some large orders recently placed at unusually low figures, but the fact that the export trade will undergo complete suspension for an indefinite period is bound to make itself felt on the domestic markets, and it is to be hoped that manufacturers will be able to finance their business so that they will not be forced to make generous concessions in their efforts to dispose of surplus quantities. Stocks of hardwoods in the south and north are not unwieldly and it is to be hoped that manufacturers will not sacrifice their product."

The Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., Aug. 15.—The war factor is the biggest element in the hardwood lumber situation. While manufacturers of a good many other products have reason to be elated over the result of the European conflict, because, it shuts out the competition of foreign makers, the lumberman is one producer who is not benefited in any way, except possibly indirectly; and it is a question as to whether the indirect benefits will be worth taking into consideration, in view of the possible offsetting factors.

It is hard to say just how much lumber has been going for export, compared with the total production. Probably it lies somewhere between ten and twenty per cent. The export trade had been quiet for some time prior to the war, but there had been a fair movement, which has now entirely stopped. This means, of course, that a large part of the lumber which has been finding an outlet abroad must now be sold for consumption at home. The big exporters, it may be said, are in a position to hold their stock, and avoid dumping it on the market at a sacrifice in price, but the number of exporters who have shipped direct to foreign buyers is small. In most cases the export houses are wholesalers, who buy of the mills as the orders come in. The stoppage doesn't hurt them as much as it does the millmen, who find that their best customers are out of the market for an indefinite period.

There are two alternatives for the hardwood manufacturer. Either he can continue cutting lumber, [illegible] the idea that he can sell it at home, or that the war will soon be over; or he can shut down his mill and await developments. The situation is simple, as far as these two propositions are concerned, but it is not so easy as it seems to dispose of the question of operating. However, there is an overwhelming sentiment in favor of curtailing production, and the chances are that the leading lumber manufacturers will have closed their mills about September 1, or as soon thereafter as their present log supply lasts. Owing to the danger of deterioration, logs cut at this season have to be manufactured quickly, so that the mills perforce will run for a little while longer. After that, however, the sawmills will either quit entirely or run at a reduced pace until the adjustment of supply and demand takes place.

It is likely that many of the small operators, expecting to take advantage of the cutting off of manufacturing activity by the leading members of the hardwood trade, will continue to run; but their importance, compared with the situation as a whole, is negligible. There is plenty of lumber available to last for some time to come, and the shutting down of the big mills will be a good thing for the business, even should the war situation not prove serious. It will give an opportunity to dispose of the surplus which has been accumulating, and will strengthen the market appreciably. If the war continues, it will prevent a demoralization due to excessive overstocks in the hands of the manufacturers. In the meantime, however, it seems likely that the consumer will be able to take advantage of the situation, which is favorable for immediate buying. While the hardwood market is not likely to react to any great extent as the result of the war, prices may be depressed slightly during the period of adjustment, or until the production is reduced, to keep pace with domestic demand. The factory man who needs lumber therefore should be able to stock up now at attractive prices, and to be able to put lumber on his yard that he can carry in his inventory a little later on at considerably more than he paid for it.

It is a fairly safe perdiction that prices will not be permanently depressed, except in the event of a long war, such as no one expects. If the war is prolonged business generally will feel the effects. But if the struggle is relatively brief, lumber quotations will rebound and possibly advance beyond the level which has been noticeable for several months. That makes it appear that during the next thirty to sixty days the hardwood consumer ought to be able to get lumber at prices which will look exceedingly satisfactory, a few months hence. Quartered oak continues to move in volume, with plain oak showing a somewhat improved demand. Beech is in fair call. Chestnut has been selling somewhat better to furniture factories and panel plants, while poplar lumber and veneers, for crossbanding purposes, have also been more active. It is interesting to note that the manufacturers of American black walnut started their drive for domestic business at the psychological moment. Until a year or two ago most of the walnut was consumed abroad. Since then the domestic trade has been using it in quantity again, and the home market is much more nearly sufficient to absorb the output than it has been heretofore in the present generation. Hence the walnut people will be able to continue producing and selling their product, apparently, without the necessity of holding up on account of the war, which would have been disastrous to their business a few short seasons ago.

An Economical Hardwood Flooring

By C. H. White

THE standard thickness in hardwood flooring are and have been for a long time past, thirteen-sixteenths, which is made out of one-inch lumber; three-eighths, which is made from half-inch lumber; and five-sixteenths square edge, which is made by resawing one-inch lumber into two pieces.

When thin flooring is required to lay over an old floor or where the greatest economy has to be exercised, a three-eighths tongued and grooved or five-sixteenths square edge floor has been laid. Where a better job and a more lasting floor is required the custom has been to use thirteen-sixteenths tongued and grooved either in plain or quarter-sawed oak.

There has, however, lately been introduced a flooring, the finished size of which is half-inch. This is taken out of five-eighths oak and has many advantages over both the thinner and the thicker flooring. Its advantages over the three-eighths tongued and grooved and the five-sixteenths square edge strips are, of course, its durability and stiffness. Where the half-inch floor, however, shows up to its best is in comparison with the thirteen-sixteenths by two and a quarter face, ordinarily known as one by three inch plain or quarter sawed oak flooring. The face of the half inch is two inches wide and the flooring is measured as two and a half inches, whereas the thirteen-sixteenths has a two and a quarter-inch face and is measured as three inches. It is thus seen that the half-inch flooring wastes only 25 per cent. in laying, whereas the thirteen-sixteenths wastes 33 1/3 per cent. In other words, when you use thirteen-sixteenths flooring and you wish to estimate the number of feet required, you must add one-third to your floor space, whereas, in using the one-half-inch flooring you only add one-quarter to the floor space. The half-inch, therefore, has one-quarter less waste than the thirteen-sixteenths, or in other words, there is a saving of 8 1/3 per cent. in the total quantity required to cover any given floor space. Added to this saving in quantity, the price of half-inch flooring is from 14½ per cent. to 20 per cent. less than the thirteen-sixteenths. The following table shows the cost in both thicknesses of sufficient material to cover 1,000 feet of floor space:

1000 Ft. Floor Space.	
Clear plain oak t. and g.	
13/16 in. requires 1333 ft. at $86.50 M. ...	$115.30
½ in. requires 1250 ft. at $74.00 M. ...	92.50
Saving effected 22.80 M. ft. = 18-8/10%	
Clear quartered oak t. and g.	
13/16 in. requires 1333 ft. at $120.00 M. ...	$159.60
½ in. requires 1250 ft. at 96.00 M. ...	120.00
Saving effected 39.60 M. ft. = 24-8/10%	

Some architects may urge that thirteen-sixteenths flooring is much more durable than the half-inch. As a matter of fact, it would take a great number of years under ordinary conditions for any kind of an oak floor to wear out and while, theoretically, the thirteen-sixteenths, being a little thicker than the half inch, should wear longer; as a matter of fact, and in actual practice, the life of a half-inch floor is as long as the life of a thirteen-sixteenths. The half-inch has all the advantages of the thirteen-sixteenths in that it can be laid over a rough sub-floor of pine boards or even directly over the joists when these are close enough. In other words, it can be used in all cases where a thirteen-sixteenths floor has heretofore been thought necessary.

Figuring Costs in the Saw Mill

By G. D. Crain, Jr.

ONE of the chief objections on the part of practical sawmill men to the arguments which have been made for many years in favor of keeping track, in an accurate and definite way, of the cost of manufacture, is that it results in no good; that the variation in the grade of lumber produced, combined with the lack of flexibility of market prices, makes it a fruitless task to endeavor to ascertain the margin of profit, or lack of it involved in operating a sawmill.

However true it may be that the lumberman must sell his product at the current market prices, over which he has comparatively little control, as an individual, there ought to be a good deal of satisfaction in knowing what and how and where profits or losses lie. The first step in the direction of correcting errors in operation is to find out the facts; and until they are known no dependable judgment can be formed by the manufacturer.

In one case which was called to the attention of lumbermen not long ago a sawmill man who also conducted a rehandling yard through which he moved a lot of purchased stock did not discover for five years that he was losing money on the operation of his mill. His business was not properly separate so as to show what each department was doing, and while as a matter of fact he was making money in his yard and losing it in the mill he remained in ignorance of the conditions until the balance went on the wrong side of the ledger through inability to offset through wholesaling operations the losses incurred in manufacture. A simple system of cost accounting would have shown the condition, and would probably have suggested the step which was finally taken, involving the location of the mill in a more favorable territory. The cost of logs had increased, through the necessity of shipping them a long distance, to a prohibitive extent, and the business had been on a starvation basis for years before the remedy was applied.

Another objection to figuring costs is that, as a matter of fact, the cost of producing one grade is the same as that of another; in other words, that it costs just as much to make mill culls as firsts and seconds. It is true that the costs apply directly against log run production; but on the other hand distribution of these costs against the various grades can be apportioned in such a way as to enable a close tab to be kept on the proposition.

This is a much better way than simply comparing the log run cost with the average price of lumber sold; that kind of comparison tells absolutely nothing except final results, which the books will show anyway; while a division of the costs of manufacture so as to have a basis, at least, on which to figure the cost of manufacturing each grade enables the lumberman to know constantly whether he is getting enough for each grade to cover the cost of manufacture.

The first step in such a system involves getting an average statement of the grade production of the logs manufactured. This, incidentally, ought to be had anyway, as it is the only sure guide to a knowledge of what sections are providing logs that cut up well and which kinds are not turning out satisfactorily. And while there is a constant variation in the proportions of grades produced, averages covering a fairly long period form a basis upon which it is safe to figure.

The cost of running the mill is easy to get at, with the aid of the pay-roll and expense accounts. The cost of the logs is known, so that the total representing the cost of the lumber, log-run, is easily ascertainable. The question then comes of distributing this cost against the various grades. It is done, as indicated, by apportioning to each grade its part of the expense, dependent upon the relative values of the grades.

Take plain oak, for example. Assume that the cost of logs, laid down at the mill, is $28 a thousand, and that cutting up the lumber and putting it on sticks amounts to $5 a thousand. That makes the cost, log run, $33 a thousand.

The average of the mill, let us say, show that the millman has been getting 20 per cent. of firsts and seconds, 50 per cent. of No. 1 common and 30 per cent. of No. 2 and No. 3 common out of the logs cut up.

Assuming that the cost of manufacture is in proportion to the arbitrary values fixed by the markets, and basing the proportion upon market prices of $55, $35 and $25 for plain oak in the grades mentioned, it is a simple matter to figure the cost of the grades on this basis, the results being a cost of $50.41 for first and seconds plain oak, which sells at $55; $32.08 for No. 1 common, which has a market value of $35, and $22.87 for No. 2 and No. 3 common, which brings in the neighborhood of $25. On this basis the larger margin of profit is on the higher-valued stock, this appearing because of the greater values involved.

The method used in arriving at this result may be indicated. As 20 per cent. of a thousand feet of log run is first and seconds, or 200 feet, with a value of $55 per thousand, the value of that part of the log run is $11. The average market price of the log run, on the basis noted, is $36 per thousand. Therefore the proportion of the cost of the log run, $33, to be borne by first and seconds is 11-36 of $33, or $10.083. As this is the cost of the first and seconds stock in 100 feet of log-run, 200 feet, the cost of 1,000 feet is of are arrived at in the same way.

There is an obvious objection to this method, in that the assumed costs are based directly on selling prices, whereas they should be independent of market conditions. For this reason it is advisable that an arbitrary relationship between the grade values be assumed, such as 3, 2, 1, or some such ratio upon which the cost of manufacture can be based, independent of the actual selling prices. Another advantage of this is that the mill-owner can suit himself in determining the relative values of his stock, which may or may not coincide with the valuation put upon it by the market. All of these various relationships will have to accord with the log-run valuation, of course, so that there is no chance of being very far wrong.

The use of such a system of ascertaining costs ought to be coniderable, as after the basis of valuation has been established, it should be at least suggestive as to the prices which ought to be had for the various grades, and the amount which the mill can afford to pay for logs. The latter is a particularly important point, inasmuch as the success or failure of a sawmill frequently hinges upon this very point. Some millmen seem to have no more definite policy of buying logs than to pay what other people are paying, being forced to sell at whatever the market indicates is the current value of the lumber, merely hoping that some of the money handled will stick to the lumber manufacturer somehow or other.

That this is the case was indicated by the experience of a mill-owner in the Ohio Valley, who had to pay in the neighborhood of $30 for his oak logs, laid down at his mill. It cost him $5 a thousand to put the lumber on sticks, and the log-run value of his stock was $36, taking the usual proportion of grades cut out of the sort of logs available in his territory. That left $1 a thousand for moving out of the yard, selling and operating the office.

This concern recently closed down its mill, and probably will allow it to remain closed until a more favorable basis of operation is arrived at. It is not to be assumed from this, of course, that the company lost as much money as would be indicated by the figures. The lumber cut out of the logs sometimes ran ahead of the log scale; some stock was handled in a jobbing way, and various other features helped out in the management of the mill; but at any rate the showing was sufficiently bad to justify the decision finally reached, which was to stop sawing lumber.

Plain oak prices are said by many buyers to be too high; but in view of the fact that they are not yet sufficiently advanced to give a lot of mill-owners a chance to make ends meet in a straight lumber manufacturing business, it may be taken for granted that the end is not yet. In some parts of the country where oak logs are manufactured, the only possible way to make money is to quarter the logs, manufacture a good amount of flitches and get a pretty stiff price for specialties in the way of widths and lengths needed by various consumers.

The flitch business in itself frequently helps out a lot, as this stock is always sold net cash, can be shipped green, and consequently enables a rapid turnover of the money invested in timber to be had. For anybody not able to help out his exchequer by some assistance of this kind, the hardwood sawmill does not offer much opportunity except in the centres where the supply is plentiful and the stumpage values not advanced as far as they are in other sections.

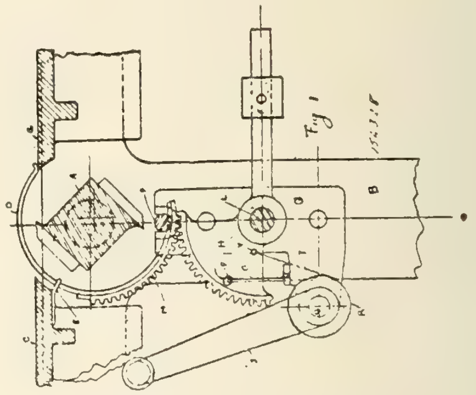
This very condition, that narrow margins of profit are the rule rather than the exception, emphasizes the need of some system of following costs. Provided the sawmill owner keeps track of his log-run production and the value of his stock as graded at the end of each day, following the course of various lots of logs purchased as nearly as possible, a fair idea of the condition of the business will be had; while by the method suggested above of approximating grade costs, a still greater fund of information will be developed.—Berlin Quality.

Imported Cabinet Woods

THE importation of cabinet woods into the United States comprises about $6,000,000 worth of logs, including lumber to the value of several million dollars. The most important item in log imports perhaps is mahogany, which runs from $2,500,000 to five million dollars a year. The annual volume of Commerce and Navigation, just issued, gives the figures for the fiscal year ending June, 1914, as $4,835,225. Nearly half the wood was exported from Europe, about an equal quantity coming from South American points, including Honduras, Mexico, and other central American states. About $500,000 worth came from Africa direct and some from Asia and Oceana, but the bulk of the supply was imported from Europe, the next largest quantity coming from Mexico direct. For the year under notice cabinet woods other than mahogany have been imported to the value of $1,441,541, of which woods to the value of $139,012 came from Japan. To indicate the development of the Japanese oak trade in America it is sufficient to state that as recently as five years ago fifty dollars' worth of cabinet timber was imported from Japan. The receipts of cabinet woods from England for the fiscal year referred to totalled $470,385. This includes some of the finest English oak and also a large quantity of Circassian walnut. Russia sent across cabinet woods to the value of over $200,000, made up largely of Russian oak, although it is impossible other cabinet woods are included, as the class is not specially stated.

Guard for Woodworking Machines

The above is an illustration of a guard for woodworking machines. The device, which has been patented by Mr. Frederick Henwood, of Toronto, is particularly adapted for use on the planer. The guard comprises a series of segmental plates provided with gears, bearings and guides. At this time when "Safety First" is so popular a watchword in the woodworking factory, this device should appeal to woodworkers, particularly those who are operating a planer.



An effective guard for the planer.

Sundry Sorts of Cedars

WHAT is called "cedar" is not at all the cedars used by Solomon in the building of his temple at Jerusalem, nor the framed wood preferred by the Egyptian woodworkers. Of the Solomon cedars there exist only about 300 trees, which are carefully fenced in and guarded, and which serve merely as a place of pilgrimage and for tourists.

Common so-called cedar is far from the scented, brownish-red real cedar, and has only the name in common with that tree. The Himalayan cedar, growing at heights of 4,000 to 20,000 feet above sea level, is the nearest relative to the cedar of Lebanon, and is used a great deal in English shops.

Similar to this cedar is the West Indian or Spanish cedar, which is used for cigar boxes. As this supply is getting scarce, substitutes have been found in the African Bosipi and the wild muscat-tree, as also our American juniper tree, which, however, is also becoming rare. Japanese cedar wood is light, soft and durable.

"CANADIAN WOODWORKER"

Bi-Monthly Essay Competition

No. 1—October

The Publishers of the Canadian Woodworker offer
Prizes to the Value of Thirty Dollars for the

Best Two Essays

on

Subjects of Practical Interest to the Trade

First Prize $20 ***Second Prize $10***

Instructions to intending competitors are given in the leading editorial on page 13 of this issue, but the following must be regarded as the conditions of the competition:

1.—Competitors shall be engaged in some branch of practical woodworking in the Canadian trade.

2.—The subject of the essay shall be at the selection of the competitor, preference being given to topics affording a solution to some practical problem of general interest to the trade or constituting a "short cut."

3.—Drawings (if any) may be sketched roughly, in which case they will be re-drawn at the office of the Canadian Woodworker. Preference will be given to drawings executed neatly in Indian ink.

4.—Essays (not to exceed 1,000 words) shall be written or typed on one side of the paper only, leaving ample marginal space.

5.—Articles for the October issue competition must reach the Editor not later than September 30.

6.—Awards shall be made on the basis of practical interest rather than literary merit.

7.—The decision of the publishers in the matter of awards shall be final.

8.—The publishers reserve the right to publish the articles submitted.

To the Reader

Cultivate the habit of getting ideas. Then put your ideas into black and white so that you may remember them and contribute something to the greater efficiency of your trade as a whole.

Exchange methods with the other fellow.

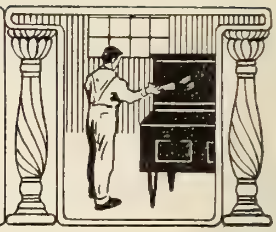
Learn to write. Concentrate upon clean-cut, descriptive English, written in short sentences. The exercise is helpful to the business man and helpful to the factory employee who means to get away from the bench some day.

Take a lead. The world's greatest need is leaders.

It is the winners in the competition of life that become leaders here and hereafter.

Address all communications to THE CANADIAN WOODWORKER, Nicholls Building, Toronto, marking your envelope in the lower left-hand corner, "Competition."

THE FINISHING ROOM



Modern Methods of Varnish Drying

THE great problem before the finishing room today, and which, because of its vast importance, calls loudly for a solution, is: What is the best method for drying varnish? The question is a very complicated one, made so by the various interests involved. There is the question of the effect upon the veneer in the case of built-up stock, and the question of the effect upon the glue in both solid and veneered work. In order to thoroughly solve the problem presented by the demand for a more rapid system of drying varnish, we must first understand what drying varnish really is, or, in the language of the schools, we must understand the philosophy of it, writes Thomas Wilde in Veneers.

The drying of varnish is not so much a mechanical as a chemical process, although it is necessary to have proper mechanical operation in order to facilitate the chemical operations. The drying of wood is more mechanical than chemical. A rise in temperature vaporizes the moisture in the wood, and this vapor either rises owing to its being lighter than the surrounding air, or is carried off by the passing air. In the drying of varnish the same mechanical operations are necessary in order to convey to the varnish the necessary elements to promote the drying or hardening process. There is very little evaporation in the process of drying varnish, especially of a turpentine varnish. If varnish contains a considerable quantity of benzine, that will all evaporate, but where the ingredients are vegetable products, such as turpentine and linseed oil, the process is one of oxidation and not evaporation.

Varnish, in the process of hardening, consumes large quantities of oxygen and throws off small quantities of hydrogen gas, and it consumes the oxygen more rapidly in a high than in a low temperature. Varnish will harden under normal conditions of temperature, etc., but the process will be very slow. The air will come in contact with the varnish, the varnish will extract the oxygen and consume it, and the air, which has been depleted of oxygen, has in consequence changed its weight and moves out of the way, carrying with it the hydrogen gas which the varnish has thrown off, and, when it moves away, other air takes its place. Now, this process will continue ceaselessly in a temperature of 65 deg. F., every minute and hour of the day, but it does it very slowly.

If we want to change the speed we simply change the conditions that are essential to the hardening process. The hardening process is practically at a standstill in a temperature of 50 deg. F., so that if we wish to cut in two the time required for hardening, we simply raise the temperature from 65 deg. F. to 80 deg. F., double the supply of oxygen by increasing the quantity of fresh air admitted and increasing the circulation of air. Under ordinary conditions, where the stock is sufficiently far apart to allow a free circulation between parts, the ventilation necessary to supply the required amount of fresh air will keep up a sufficient circulation without making it necessary to resort to artificial means. Whatever percentage it is desired to increase the speed of hardening, all that is required is to increase the facilities in proportion. Raise the temperature, increase the supply of fresh air and keep up the circulation.

Having outlined the principles which govern the hardening of varnish, we are in a position to discuss the means by which the hardening can best be promoted in order to decrease the time required. Very few factories care to set up a separate drying room apart from the varnish room. There are various reasons for that, and the chief one is that there is very little advantage in doing so. Varnish applied in a temperature of 70 deg. F., ought not to be allowed to congeal before going to a very high temperature and this will take from one to three hours. I take it that the average shop would prefer to convert the varnish room into a drying room at night, provided the shop could be brought to the proper temperature for the men to start work in the morning, and this can easily be done.

The first thing required is an auxiliary heating system or an addition to the one already in use. This should be of sufficient capacity to raise the temperature to 100-deg. F. in very cold weather. But a system that will hold the temperature of the varnish room at 70 when the mercury registers 20 below zero outside will not need to be augmented to any very great extent, although some slight addition will be necessary.

The next thing is ventilation. Provision must be made for allowing the fresh air to enter and the foul air to escape. This is no time to talk about "heating the whole town," as some men are so fond of doing when one talks to them about ventilation. We must have fresh air and we must get it from the outside; and we must get rid of the stale air and we must put it outside, even if it does heat the whole town. We are not putting it out to heat the town; we are putting it out because it is worse than useless inside.

In ventilating, the means for both the ingress and egress of the air should be at the top of the room. By entering at the top the cold air will more readily diffuse itself throughout the whole room and will not be so liable to come in contact with the varnish before it has risen to the proper temperature. To let the foul air escape it would be well to have ventilators in the roof, while the fresh air may be admitted by lowering the windows at the top. Of course, either the side or the top will furnish the means for both ingress and egress itself, but it would be better to use both.

So far we have heat, fresh air and provision for the escape of foul air. These are the ideal conditions for the drying of varnish. When the workmen leave the room at night, most of the varnish is in ideal condition for being subjected to high temperature, and as the rise in temperature should be gradual, the varnish that was applied just before quitting time will have set sufficiently to be beyond danger before the temperature reaches the danger point. The means of ventilation should not be opened suddenly, but should be opened gradually as the temperature is raised until a maximum of temperature and ventilation has been reached. In this way the temperature of the room may be safely raised to 120 deg. F.

Now this same varnish room must be put in shape for men to enter and work by starting time in the morning. This can be done by the use of a fan, the power of which must be governed by the size of the room to be cleared out. The fan should be located near the ceiling at one end of the room. A pipe 12 or 15 in. in diameter should extend from the fan along the centre of the room, near the ceiling, to the farther end of the room. At intervals of every 6 or 8 ft. along this pipe, on the upper side, holes should be cut. These holes should be of various sizes; the largest, say 4 in. in diameter, should be near the end farthest from the fan, and decrease in size as they approach the fan, until the one nearest is not more than 2 in. in diameter. The power of the fan will be greatest close to itself, hence the reason for having a graded size of holes. There is always a certain amount of foul air which, being heavier than the rest, accumulates near the floor. This cannot very well be drawn off from above, and some provision must be made for drawing it off from below. In order to do this 4-in. pipes should be run up the side of the wall from the floor to the ceiling, then along the ceiling, and connected with the main pipe that runs from the fan to the other end of the room. These pipes should be placed on each side wall at intervals of about 25 feet.

When it is desired to clear the room and lower the temperature for the workmen, close the ventilators in the ceiling and leave those in the wall (windows) open at the top. The length of time required to change the air will depend on the capacity of the fan and the speed at which it is run. But it would be well to lower it slowly, say at the rate of about 25 deg. an hour, until the proper temperature for working has been reached. This will allow the stock to adjust itself, without injury, to the changed conditions. When the fan is first started to clear out the room it would be well to keep the heat on full force. Let it remain on until the temperature is within 10 deg. of normal, then close off the auxiliary, leaving only the day system on. With this method the varnish room contains all fresh air when the workmen arrive in the morning, and is, therefore, in the very best possible condition—much better than could possibly be had under ordinary conditions.

One other advantage which this plan has over ordinary drying rooms is that the stock, when removed, is not subject to sudden changes of temperature, such as would be the case were stock removed from the drying room to the work rooms, unless the temperature were lowered specially for that purpose; neither is the stock taken suddenly into the high temperature, but every change is made gradually.

The Sap Problem and a Phase of Staining

Contributed by Walter K. Schmidt.

WITH the closing of the furniture season, we read the same reports as to the sales, the number of buyers, and the lines exhibited much as we have had in each preceding year. While every sales season is of particular interest to the artisan, and possibly of more interest to the writer, it is a notable fact that this season found more foreman finishers, superintendents of plants, and others generally interested in wood-working industries than one would naturally expect to find. The time seemed to be slowly but surely edging up to a point where every manufacturer was beginning to cast about for such information as the Canadian Woodworker is endeavoring to give its readers through its various sources of information. It is apparent that the woods that are being consumed to-day are not of the quality that they were a decade ago. This throws more responsibility upon the cabinet room, where care should be taken in the laying and matching of the wood so as to save the immense amount of labor and time caused by inattention to the wood.

The foreman finisher is daily confronted with new problems attributed to the aforesaid, and also the fact that he is expected to turn out as beautiful a finish as was possible in years gone by.

The inquiries that come from Canada show that the desire for detailed information is quite general, and the information that is being sought will sooner or later be required at one time or another in any furniture factory. It is, therefore, the object of this article to treat these subjects separately, and those seeking information will find their questions answered.

To some of our readers these replies may have come by mail, but they will be gracious in the matter and realize that a brother finisher may be experiencing the same difficulties. This is one of the inquiries: "Can you tell us how to overcome the sap parts in oak, when producing fumed oak?" Our experience is that whether we employ the fuming process or stains (we have used almost all kinds) the finished work will show gray or darker in the sap parts of the wood. The difficulty where several kinds of oak happen to come in the same piece is similar, but not so apparent. This is objectionable in our business, the manufacture of chairs, especially when it manifests itself in the seat or one of the legs. This style of inquiry is general. All the laboratory experiments bring me to the conclusion that the overcoming of the sap part is not impossible, but it is impractical. In other words it can be done, but the price is prohibitive. Various bleaches have been employed, such as chlorinated lime and oxalic acid, but the one that does the best work is the coating of the sap parts with a 4 per cent. solution of permanganate of potash, allowing it to dry, from three to four hours, and then applying a coat of oxalic acid, say 5 per cent strength. A per cent solution is easily figured this way. To make a 4 per cent solution add five ounces to the gallon of water, and for a 5 per cent solution use six and a-half ounces. I give these figures this way because they were found completely to neutralize each other in the bleaching process.

After the sap is treated in this manner, and sanded down proceed in the finishing in the [illegible] The oxalic acid has in this treatment a peculiar effect of closing the pores so that the sap part is not so susceptible to the stain. You will note that in the process the oxalic acid neutralizes the permanganate, which by the way produces a decided brown effect, whereas when first mixed it is of a beautiful violet shade. Those who may decide to try this experiment may jump to the conclusion that permanganate of potash will make a pretty brown. We agree that it will, but unforunately it is not permanent, and is a treacherous chemical when it comes to depending upon it for more than immediate action. In many factories they have a man whose sole duty is to prepare the panels and parts of the cabinet work in which he finds a striking difference in the shades of the wood. Every manufacturer knows that in the side of a cabinet, or a table top, where boards are matched, there will be a piece or two when finished in the regular manner that will show up much darker than the adjacent pieces. It is the duty of this man, who has been found to be proficient, owing to his aptness and experience to stain these parts before they are handed or passed along to the general staining crew. He virtually inspects the piece, and being provided with several strengths of stain, coats the various pieces with such strengths of stain so that when it is filled, sanded or shellaced, as the case may be, a general uniformity is the result. Where stains are used this process, or rather method is in my opinion the only efficient and practical way. Bleaching processes are too uncertain, require too much time and fussing, and after all the time has been expended, there is no assurance of results.

When the fuming process is employed this method would not be operative. In the fuming process, a good deal of assistance can be obtained from the use of tannic and pyrogallic acid, in conjunction with the length of fuming the work. By increasing the acids, which are largely the color giving values of the oak wood, we correspondingly decrease the length of fuming. Therefore, the operator in applying a solution of these acids, stints the amount he applies on sap wood and discolored wood, so that the furniture when passed on to the fuming box represents a comparatively uniform amount of tannin to be subjected to the fumes of ammonia. Some years ago the writer put on the market a compound made of tan bark extract, which was taken up by various concerns. This was nothing more than tan bark extract. Some call it chestnut bark extract, and quebracco extract, but it was usually supplied by tanners supply houses as tan bark extract. It has the appearance of a brown syrupy liquid, and its essential qualities are the presence of the tannin or tannic acid. It found ready market from the fact that being in itself a heavy brown liquid, and when diluted according to directions gave the wood by its physical appearance a brownish shade. When subjected to ammonia it would shorten the amount of fuming, and to a certain degree make for uniform results.

To those who are not using a fuming box, the pyrogallic acid and the tannic acid render much service. They can apply this solution, say an ounce of each to a gallon of water, then a second coat of various strengths of bichromate of potash, carbonate of potash and ammonia. This alkaline solution will produce a brown shade, thoroughly imbedded in the fibres of the wood, so much so that the edges will not wear off in years. In this manner it produces practically the same chemical changes that take place in the fuming process.

The staining proposition is simply a matter of putting together non-fading aniline dyes with a mordant producing the correct shade. In the foregoing lines we have endeavored to reply to inquiries relative to the now most popular of oaks.

How to stain oak gray and leave the pores white is a query which, in itself, would be easily answered were it not known to the writer that the general showing of samples in gray at the July sales, especially in New York, had a tendency towards a Tiffany finish with considerable showing of white in the pores of the wood. If the work is new (and it is presumed that it is), many ways for producing grays are at the disposal of the foreman finisher. Where small quantities are to be done, I would suggest buying the stain prepared. A good gray can be produced by the use of a nigrosine which is an aniline black, to which is added a bit of yellow to tone down and produce the gray, but the best grays are obtained by the addition of an iron salt to this nigrosine solution, governing the quantities used by the depth of color desired. A little experimenting will be necessary. It is advisable to know what the stain will do before the regular work is attempted. It might be well for me to say that where difficulty is encountered, owing to the difference of wood, a weak solution of tannic acid applied first will greatly assist the iron salts in producing the gray. This process can be carried on, and the strength so increased that a perfect ebony can be produced. After the stain has thoroughly set, say twenty-four hours, and the wood has been sanded, apply the filler coat by mixing zinc white which is carbonate of zinc and which should not cost more than five or six cents per pound in the dry form. This should be mixed with turpentine only. Another method is to take the ordinary beeswax, or a prepared furniture wax, and thin it down with an equal part of turpentine. Apply this wax to the wood, and into the wet wax sprinkle the dry zinc white, then with coarse rags or burlap rub in a circular manner until the pores are filled and the wood is polished. Before delivering these goods, they should again be polished. Some manufacturers do not fill the wood but produce a gray known as Kaiser gray. After thoroughly sanding the wood apply paraffin wax which has been melted and thinned with turpentine, and when cool lengthened with naphtha, so that it has about the consistency of glycerine. Rub this well into the wood. It will produce a smooth finish, absolutely transparent. Others fill the wood with zinc and give the work a final cost of lacquer. This lacquer coat, however, has been found not to withstand the elements especially where furniture of this make-up has been exposed to the atmospheric changes along the seashore. These same grays can be made upon other hard woods such as maple and birch, and the result is what is known as silver gray and the gray maple. Steeping the wood in a hot solution of sulphate of iron will produce a gray maple which may be plain, as the color will penetrate from an eighth to a quarter of an inch. Frame manufacturers resort to this by immersing their veneers, notably birdseye, in a solution of sulphate of iron, allowing this to dry for forty-eight hours before laying the veneer. These frames are sold usually without any further finish excepting a careful sanding.

One hard knot can do more damage to the edge of a planer knife than a hundred feet of clear surface lumber, and it is not worth nearly as much after it gets through.

How to Get a Clear, Transparent Finish

By J. C. Carmen.

RECENTLY the superintendent of a large furniture factory consulted us regarding some trouble their finisher was having with mahogany. He complained that the finish did not have that clear transparency that characterized our goods. We told him how we did our work, but as he was not familiar with the details of the work in his own shop, we were not able to point out the cause of the trouble at that time.

But the following day their finisher came over, and as he was willing to learn and we were willing to instruct, we soon got down to business and he was sent away happy.

He had been trying to finish his mahogany in the same way that he had been finishing his oak, altogether forgetful of the fact that the vast difference in the woods required an equal difference in the method of finishing. The usual way of finishing oak is to stain and fill, and then put on a coat of surfacer and varnish. But this process is almost certain to result in a murky finish if applied to mahogany.

Mahogany does not sand as smoothly as oak and other harder woods. The fine hair-like fibers will bend beneath the sandpaper, and when some of them are cut off others rise to take their place. It is a good plan to get as much as possible of this fiber cut off before the wood is stained. If the wood is sponged with clear, warm water before it receives the final sanding, the sponging will raise the fiber and it may be cut off with fine paper.

If a water stain is used this will raise more of the

(Concluded on page 38).

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

WOOD STAINS

Ready to Dissolve—Shade Always Correct

Write for Our New Price List—It's Free for the asking

The Book of "GASCO" Stain Products

Compiled by Mr. Walter K. Schmidt, *our Chemist*

and get into direct communication with the originator of these *"Ready to Dissolve" Dry Powder Stains.*

Get our samples of the later creations,—standard shades of Fumed Oak, Grey Oak, Grey Maple, "Brown Mahogany," Sheraton Mahogany, Jacobean oak, etc., etc.

Full direction for procedure with every order—permanent results.

Canadian prices made in consideration of Tariff.

Special—Our Oil Soluble Fumed Oak for quick work.

We will send you working sample.

Get our prices on Blacks, Reds, Yellows, Browns, Oranges, etc., etc. If you have a color to match—we do it.

German - American Stain Company
16 Monroe Avenue (*New Number*) Grand Rapids, Mich.

Our Goods are stocked by: THE WINNIPEG PAINT & GLASS COMPANY, Winnipeg, Man.

fibers. To overcome this the plan is to allow the stain to dry out thoroughly, then coat with a very thin solution of shellac, not more than 1-lb. of gum to the gallon of solvent. Bleached shellac is better than orange shellac for mahogany, but it must be fresh. Use denatured alcohol as a solvent, and make sure that the shellac dissolves completely. If it will not do this—if you find particles that will not dissolve—you had better discard the whole thing, because it is unfit for use on mahogany. Straining will not make it right. If shellac in this condition is used on mahogany it will give it a milky cast.

When this thin coat of shellac is dry, one will observe that the fibers are all standing on end, and the shellac will hold them in this position. They may now be sanded lightly with very fine paper, which will now cut off all these fine points. Great care must be exercised with this sanding so as to not sand too deeply and give the work a faded appearance. If these fine fiber points are not cut off, the filler will gather around them and give the work a murky appearance.

If one should by accident sand too deeply, rub a little stain on with a cloth, wiping off quickly, then coat with the thin shellac in the usual way. After this is done the work may be filled, and if good shellac and varnish are used, a clear, transparent finish should result.

Shellac should not be applied to mahogany in a very humid atmosphere. If the shellac is seen to take on a greenish cast before it dries, it is an indication that the humidity is too high and operations should be suspended. Shellac applied under such conditions, even though it seems to come back to its normal condition, will be liable to give mahogany a milky cast.—Veneers.

How to Produce Brown Mahogany

BROWN mahogany is a subject which is absorbing a good deal of attention in many finishing rooms at the present time. The new shade has taken such a hold on popular favor that the demand for it has created quite a stir among finishers who have experienced not a little difficulty in producing it. There are various shades of this brown mahogany, as there are various shades of golden oak, of early English oak, and other finishes. When the base of the color is obtained, however, the finisher can usually make from it any shade he desires. "Two stains are usually required to produce good results," says Veneers. "The first is a solution of bichromate of potash. Dissolve thoroughly six ounces of bichromate of potash in 1½ gallons of water. Coat the wood with this and let stand until quite dry, after which sand with fine paper to remove any fuzz. Then coat with a solution made up of half a pound of English oak powder, five ounces brown mahogany powder, 2½ ounces nigrosine and 1½ gallons of water. This stain may not produce a uniform color and some touching up may be necessary. For this touching up work prepare the following stain: three ounces bichromate of potash, ¼ ounce nigrosine, ¼ ounce brown mahogany powder, ⅛ ounce red mahogany powder, and four ounces chromic acid. Allow the chemicals to dissolve thoroughly, then reduce small quantities of it to the shade required.

"50"

FLAT VARNISH

The most convenient and satisfactory flat finish made.

Gives the "rubbed" effect to perfection, and does not show brush marks.

R. C. Jamieson & Co., Ltd.

Established 1858

Montreal Vancouver

Owning and operating P. D. Dods & Co., Limited

OVER FIFTY YEARS OF EXPERIENCE GUARANTEES THE HIGH QUALITY OF OUR PRODUCTS

Oil Soluble Stain Powders

Try our latest and best production.
A perfectly Oil So'uble

Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Walter K. Schmidt Co.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

The Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

THE GLUE BOOK

WHAT IT CONTAINS

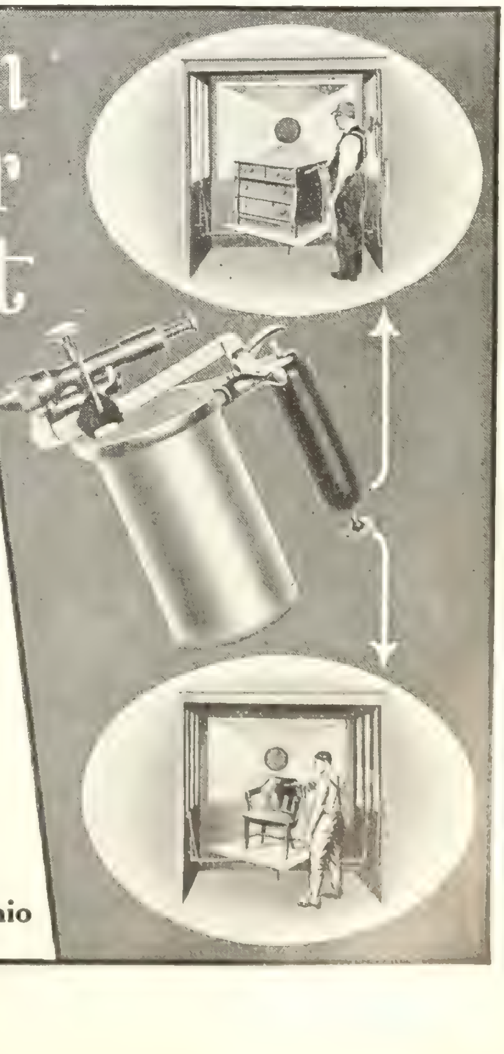
Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
Nicholls Building, Toronto

A Better, Finer Finish at a Lower Cost

With the Aeron Guaranteed System

Paints With Air



which applies first coaters, enamels and varnishes—thereby removing the inefficient, unsatisfactory hand brush from the finishing room, a smooth and uniform surface is always obtained. There are no brush marks, no thin spots, no sags, no runs and no fatty edges. Every article of furniture comes from your factory perfect in finish—a finish that cannot possibly be produced in any other way than with the AERON SYSTEM.

Along with this marked improvement in finish, there is a surprisingly big saving in time and labor. In AERONING, there is no lost motion, one man accomplishing as much as 2 to 8 with a brush—doing better work—effecting a saving of 25 to 90 per cent.

SIMPLE IN OPERATION The AERON will instantly and accurately respond to the operator's every inclination will meet every requirement. No matter how irregular or rough the surface may be, or how difficult of access the places are, the AERON finishes smoothly and readily. The complete equipment and service is installed on a guaranteed basis.

PROVED RESULTS The AERON SYSTEM is used in hundreds of furniture finishing rooms, and is faithfully and successfully performing its every function. These manufacturers receive daily proof, in the form of savings and better work, of the merit, the economy, the efficiency of the AERON—our claims are based on these actual and regular performances of the machine.

A Post Card request from you will bring
AERON Catalog and AERON Detailed Information BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr Street, Toledo, Ohio

Veneers and Panels

Flexible Forms in the Veneer Department

By Leonard A. Blake

A curved surface is a synonym for trouble with a man or a machine or a department that has long been engaged with purely straight work. This statement is particularly apt when applied to the veneer department. Naturally enough, many men would not consider that a veneer department could be rightly so called if it had not a certain amount of curved work to do as a regular thing, also the necessary appliances for doing such work.

Nevertheless there is often the cause of a factory undertaking work that is out of its line either for one special job or with a view to working it in as a regular feature of the business. Thus it may happen that a veneer shop may be called on to produce odds and ends of curved stock while it is only provided with apparatus for straight work. The fact that the curved stuff does not come regularly nor in large quantities of any one pattern renders the cost of making solid forms show up in rather alarming proportion to the total amount of money in the job. What is wanted is a form that can be used on varying sizes and shapes, and the sheet metal form which is the subject of this article just fits these requirements. The scope of one form is not unlimited, but one of these will take the place of several solid forms.

For the purpose of illustrating the manufacture and use of this kind of form we shall consider the veneering of small turned columns and also of curved drawer fronts.

For both these shapes the form is made as a wooden trough with a piece of sheet metal stretched across the open side, but sufficiently slackened to cover the veneered surface when the pressure is applied. The edges of the metal are secured to the wood by screwing through a strip. It is always possible, where necessary, to make an extra row of screw holes so that more or less, as may be required, of the metal may be taken up. This gives that sort of form the adaptability that is its chief merit.

When used on drawer fronts, two fronts are placed back to back, and the forms are laid over the veneer and clamped, either with band screws or in a press. In this latter case several pairs could be clamped at once.

With columns the sheet metal has to be set very finely so that the entire surface of the veneer will come under pressure without, allowing the two halves of the form to do more than touch. The accompanying figures will doubtless make the application of these forms better understood than any lengthy dissertation on the subject.

In the veneer industry there is one product which is entitled to more attention that it receives. It is the straight three-ply panel. What is called plain, three-ply, built-up lumber used for boxes and for back panels of furniture, is an item of considerable importance. They are used not only for drawer bottoms, but as panels in regular house doors, and also as panel work in doors and sides of furniture of various kinds. Discussing the practical value of the panel, Veneers observes editorially: "With some of the important panel manufacturers this regular three-ply panel has really been the bread and meat of the business. It has been the starting point from which the more important panel work develops, and it remains to-day one of the best, if not the biggest item in their list

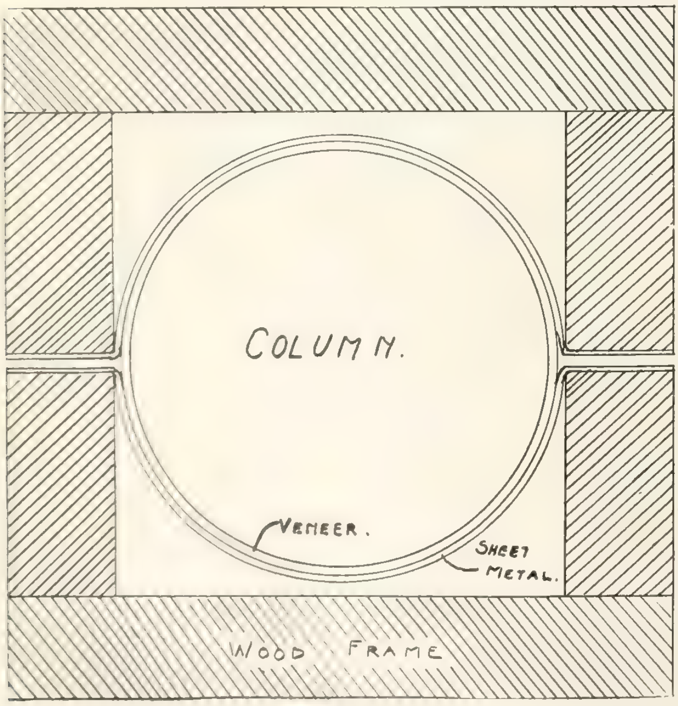


Fig. 1—Veneering small columns.

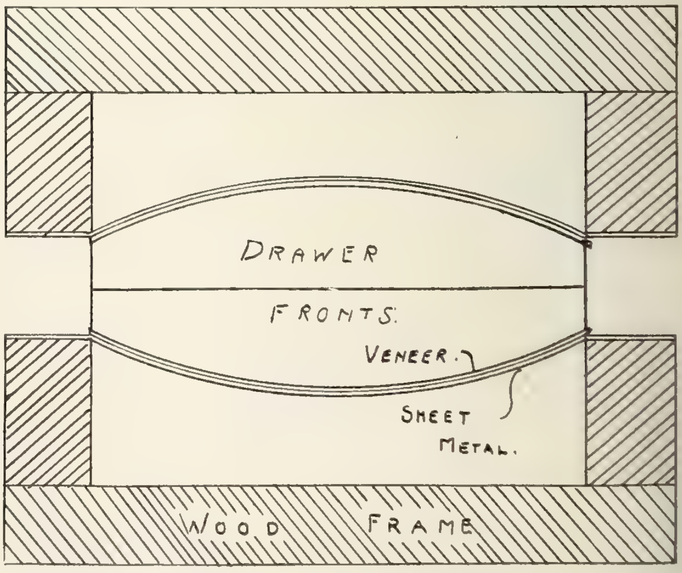


Fig. 2—Veneering curved drawer Fronts

of products. It constitutes, too, quite a factor in our face veneer work, often comparing well with some of the fine work done with thin veneer on top of cross-banding. There is used in this panel for face work quite an assortment of our native woods, including birch, maple, gum and oak, the face veneer being cut thick enough primarily that it is not essential to use a cross-band under it. It is simply made up into three-ply work with either poor material of the same class used for fillers or with a centre of some other kind of wood. In short, the three-ply panel, although it does not enter as extensively into technical discussions as some of the special veneer work, really constitutes such an important item in the industry that it may be pretty generally classed as the bread and meat of the business."

Use of Veneers and Hardwoods in Fixtures

FIXTURES are midway between furniture on the one hand and interior finish on the other. Furniture is intended to be moved from place to place, as occasion requires, and with certain exceptions it will fit one room as well as another. Interior finish is not intended to be moved. It is built where it is meant to stay, and it becomes a permanent part of the room in which it is placed. Fixtures are not exactly furniture nor can they be properly considered as finish, but partake of the character of both. They may be built in place, or they may be moved in and out; but unlike most furniture, they are intended to occupy a certain position, and would be out of place anywhere else.

There are other differences. Interior finish is often largely ornamental, and is made with that idea in view, though, of course, usefulness is always borne in mind by the builder. Fixtures are more directly associated with business. They may be highly ornamental, but that is not the principal matter held in view. The man who buys fixtures does so with the idea that they will improve his business chances and make money for him. The buyer of furniture may not regard it as a money-making matter; but the buyer of fixtures always thinks of that phase of the situation. It is the main thing with him. He wants his fixtures to look nice, and designs them with the object of improving the appearance of his place of business; but that is only the means to an end, and the end is money-making. The makers of fixtures and the buyers of them study every point that will increase business. The purchaser expects them to serve as profitable advertising and he expects also that they will assist him in carrying on his business.

Fixtures are of several kinds, classified according to the business which they are designed to assist. Those intended for one business are useless for another. Specializing is, therefore, necessary on the part of the manufacturer. He must know the wants of the buyer before he makes the article. Five general classes of fixtures are made, according to use intended. These classes belong to banks, stores, offices, barber shops, and saloons. There are, of course, many special kinds and modifications which do not fall in any particular class, but kinds include the majority of the fixtures manufactured, and most manufacturers specialize on one or the other of the classes.

The making of fixtures is an important industry in this country. The total quantity of wood demanded annually is not known, but it runs into hundreds of millions of feet, and some of it consists of the finest woods on the market. A few figures selected from statistics collected in the three contiguous states, Michigan, Illinois, and Missouri, show the extent of the industry in that region, and it is doubtless typical of the fixture industry in the whole country.

In Michigan twenty-two woods are reported in use by fixture manufacturers, and the yearly demand exceeds 24,000,000 feet at an average cost at the factory of $38.51 per thousand. There are five wood-using industries in Michigan which pay a higher average price for their lumber and twenty-seven which pay less. The total annual use of wood by the industry in Illinois exceeds 21,000,000 feet, made up of thirty-one woods, at an average cost at the factory of $41.44. Of the fifty-one wood-using industries listed in Illinois, ten pay more than fixture makers for lumber, and forty pay less. In Missouri the manufacturers of fixtures use twenty-eight woods, aggregating 10,000,000 feet a year, at an average cost of $37.24 per thousand feet. Of the twenty-three listed industries in Missouri which use wood as raw material, four pay more and eighteen pay less than fixture makers.

It is thus apparent that material much above the average is used by fixture manufacturers. Those located in the three states named buy twenty-eight per cent. of their lumber in Michigan, Wisconsin and Illinois; fifty per cent. in the Ohio and lower Mississippi valleys; three per cent. on the Pacific coast; and the remainder in various parts of this country and the world at large. It is interesting to note the exact amounts of different woods used yearly by fixture manufacturers in the three states of Michigan, Illinois and Missouri. The woods and the annual quantity of each are shown in the following table:

Wood	Feet used annually
White oak	11,181,000
Maple	8,800,000
Red oak	6,075,000
Birch	5,470,000
Yellow pine	4,098,000
Elm	3,385,000
Yellow poplar	3,382,000
Basswood	1,928,000
Red gum	1,835,000
Chestnut	1,452,000
Cypress	1,393,000
Mahogany	1,320,000
White pine	1,260,000
Beech	778,000
Cottonwood	688,000
Sycamore	630,000
Ash	525,000
Hemlock	250,000
Douglas fir	240,000
Spruce	221,000
Redwood	200,000
Black willow	150,000
Black walnut	[illegible]
Cherry	[illegible]

---

* Abstracted from the Hardwood Record.

Butternut	26,000
Tupelo	16,000
Norway pine	10,000
Sassafras	10,000
Hackbury	6,000
Hickory	5,000
Circassian walnut	5,000
Red cedar	2,000
Padouk	1,000
Satinwood	1,000
Locust	1,000
Total	55,495,000

The total cost of the above material delivered at the factories was $2,187,023, of which $381,618 were paid by Missouri factories, $872,995 by those in Illinois, and $932,410 in Michigan. Much of the material is high class. White oak leads in quantity, followed by maple, with red oak third, and birch fourth. Eighty-six per cent. of all is hardwood, and the rest is pine, hemlock, cedar, fir and spruce. Material is drawn from all parts of the country, but most of it comes from the South. The three states for which statistics are shown are centrally situated, and doubtless represent average conditions in the fixture industry for the whole country.

Only about two and a half per cent. of the wood comes from foreign countries. This information will surprise most persons; for the belief is quite general that fixtures are made largely of mahogany, rosewood, ebony, satinwood, Circassion walnut and other foreign woods. Some of these woods are used, but on an average only about one foot for forty of home grown material.

The reason that expensive foreign woods make such a prominent showing in fixtures is that they are generally employed in the form of veneers, cut very thin, and glued on cheaper woods. One board foot of lumber is good for twenty or thirty surface feet of veneer. A mahogany log, for instance, that scales 500 board feet may be sliced to make from 10,000 to 30,000 feet of veneer; the veneer is applied so faultlessly that it looks like solid wood. Veneers for fixtures are made of other woods than mahogany. White oak supplies more than mahogany and red oak probably more. When veneers are used as surface finish the wood is nearly always selected on account of figure. If it is oak, it is quarter-sawed. If birch, the figure is due either to the bird's-eye effect, or to the curly or wavy grain. If mahogany, the figure is formed by interlocking or divergent fibers which produce the surface effects so much admired in this wood. Black walnut and cherry have little figure, properly speaking, and when they are worked into veneer, artistic color is the chief effect sought. The figure which characterizes Circassian walnut is due to peculiarities of growth, and is largely independent of the colors in the annual rings or in the medullary rays. Red gum (including both sap and red, for it all comes from the same tree) has a figure which closely resembles that of Circassian walnut, but the best figure can be had only by careful selection of material. Good judges of woodwork are well aware that gum veneer often passes as Circassian walnut, and is not a bit less handsome and artistic.

The best class of fixtures show the highest use of fine veneers. The broad panels and large surfaces display artistic woods to the best advantage. If a fixture manufacturer comes into possession of a choice lot of veneer, he does not need to wait long for a chance to work them into commodities and sell them. His customers are usually men who want the best and are willing to pay reasonable prices to procure it. For that reason the fixture manufacturer can go into the market and stock up, with choice material and rest assured that his product will sell when it is made up.

It should not be assumed, however, that no common and medium-priced woods enter into the construction of fixtures. There is something back of the beautiful surfaces. Veneers are glued upon cheaper woods, but they are often cheaper by comparison only, for those woods are selected with care, and must possess special properties. The woods on which fine veneers are glued are known as cores or backing. They must possess the property of "standing." That is a term which means that the wood shrinks, swells, and warps but little. It is essential that corewood possess this property; otherwise the veneer glued upon it will split or buckle, and become damaged.

A number of woods make good backing or cores. White pine is usually considered to be one of the best, provided it is clear stock and well seasoned; but such stock is now too expensive for general use. Chestnut is second choice. In fact, some consider it equal to white pine; but it must be thoroughly seasoned, and chestnut is a somewhat difficult wood to season except by the slow process of air-drying. It is therefore necessary to keep it on hand for a considerable time before using in wide panels and other work; but when it is in just the right condition it is excellent core wood and it may be depended upon to hold its shape, and to protect the veneer glued upon it.

The grade of chestnut known as "sound wormy" is by some manufacturers considered better than unperforated wood for backing. The thousands of worm holes cause the glue to adhere better, and the strength of the perforated wood is ample. It is also a little lighter than sound chestnut. The holes, the size of a large needle, are made while the tree is standing, but the insects continue to work for a time after the logs are cut, and in some instances, after the lumber is piled in the yard. The insects penetrate to the hearts of large chestnut trees, and there is reason to believe that a single tree may harbor successive broods during 200 or 300 years. Chestnut timber in the South averages older than that in the North, and more of it is wormy, and for that reason more valuable as backing for veneer. The spread of the chestnut blight makes it probable that more chestnut lumber than usual will reach the market during the next few years, for owners will try to sell their timber through fear that they will lose it if they let it stand.

Where an operator of a circular ripsaw, by working at the machine for several months, had acquired better means of knowledge than his employer as to its condition, the employer was not liable for injury sustained by the operator, through unexplained failure of the saw to work properly at the time of the accident.

An owner of a sawmill is liable for injury to adjoining property caused by partly burned sawdust transferred into cinders or charcoal being blown upon such property, to the discomfort and annoyance of the owner. This is the decision of South Carolina Supreme Court in a case recently tried against a lumber company.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first
MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB Reg U S Pat Off **Hoffman Bros. Co.** HB Reg U S Pat Off

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods
ANY THICKNESS,
1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—*SPECIALTY*—

HB Reg U S Pat Off **Indiana Quartered Oak** HB Reg U S Pat Off

Sawed Quartered Oak Veneers

WHITE OR RED — HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

WRITE US FOR PRICES

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

MAHOGANY

Mexican, African, Cuban

Circassian Walnut

As direct manufacturers of Mahogany from stump to consumer we are able to offer better stock at lower prices than can be obtained elsewhere.

Ask us to have a traveller call with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,

Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - Ohio

Write for a quotation on this space—it will put you in touch with veneer manufacturers.

Goshen Veneer Co.
GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

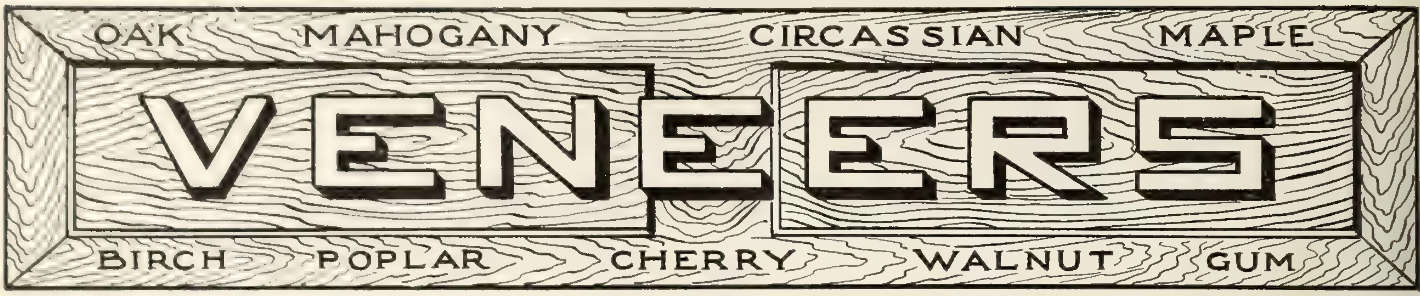
Write us to-day for
Poplar and Red Gum Veneers and Crossbanding

CIRCASSIAN WALNUT VENEER

Lot No. 1, 9 flitches, 16000-ft., average value 4 cts. per foot.
Lot No. 2, 13 flitches, 23100-ft, average value 2 cts. per foot.

A DISCOUNT OF THIRTY PER CENT
Offered First Cash Buyer.

HUDDLESTON-MARSH LUMBER CO., 2260 Lumber Street
CHICAGO, ILL.



PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES— - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS
American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:

BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM

Quartered

3 cars	4/4,	1's and 2's
2 "	5/4	"
1 car	6/4	"
1 "	8/4	"
3 cars	4/4	No. 1 Com.
1 car	5/4	"
1 '	6/4	"
1 "	8/4	"
1 "	10/4	"

RED GUM

Plain

4 cars	4/4,	1's and 2's
2 "	5/4	"
1 car	6/4	"
1 "	8/4	"
1 "	10/4	"
2 cars	4/4	No. 1 Com.
1 car	5/4	"
1 "	6/4	"
1 "	8/4	"
1 "	10/4	"

THE FAMOUS CACHE RIVER GUM

Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

The Glue Book

What It Contains:

Chapter 1—Historical Notes
Chapter 2—Manufacture of Glue
Chapter 3—Testing and Grading
Chapter 4—Methods in the Glue Room
Chapter 5—Glue Room Equipment
Chapter 6—Selection of Glue

Price 50 Cents

Woodworker Publishing Co.
Limited
Nicholls Building, Toronto

Hard and Soft Wood Finishing

By A. Ashmun Kelly

OIL or any liquid containing oil, as oil varnish, will darken hard pine, and hence is best to omit as a first-coater at least. White or orange shellac varnish may be used to first-coat with, after which any suitable varnish may be applied, in any number of coats from one up, each coat to be rubbed, if the finish is to be a good one. For cheap work glue size may be used in place of shellac, and hard-oil varnish for a finish, one or two coats. With Georgia pine, as indeed with any wood, to get a first-class finish the surface must be made quite smooth with sandpaper. And when the bare wood is made thus smooth it is much easier to keep each succeeding coat smooth.

If used as a wainscoting and the wall is not perfectly dry or subject to dampness, better paint the backs of the wood.

As considerable elm is being used now in house finish it may be well to say something of its peculiarities and treatment. It has a rather large, open pore, hence must be paste-filled. It has a fuzz, technically known as whiskers, and these will cause trouble in staining if not removed. The fuzz catches the stain or filler and causes clouds of color, a muddy appearance. Here is what to do: Mix some paste-filler with some liquid-filler to form a suitable paste, and add to this enough turpentine to make a liquid-filler of it, stir well together, and color as desired; apply with a flat chiselled bristle brush, one about two and one-half inches wide. Lay this filler on as you would stain, evenly and uniformly, then allow it to stand fifteen minutes. At the end of this time it will have become flatted, with a soft velvety feel. Then after twelve hours rub off lightly with No. 0 sandpaper, making surface smooth. Then apply a coat of thin liquid-filler, which at the end of another twelve hours may be made smooth with fine sandpaper. Then you may apply any desired varnish finish.

Another matter, elm has some sap spots, and these must be stained to match the rest of the surface. This is done after the wood has been filled and sandpapered, going over the sap spots with a sponge or soft cotton rag and a cup of water color, burnt umber or Vandyke brown. This if done carefully will make the entire surface uniform of coloring.

Use turpentine, not benzine, in thinning fillers for elm.

Birch is another popular wood for house finish. It may be finished natural, or stained to imitate other woods. For the latter purpose the curly, of either white or red birch, is best. It may be stained to imitate mahogany, golden oak, etc., the natural finish being without luster, to look best. The stain may be either dead or with luster, as preferred.

A close-grain wood, birch requires no paste-filler, yet it is often so filled, in order to minimize the effect of the water stain on the wood. Mix five pounds of stiff paste-filler to a gallon of liquid, colored to suit. In 24 hours sandpaper smooth, then apply a priming or liquid coater, colored to suit. In another 24 hours sandpaper and flow on a full coat of cabinet varnish. Then polish in the usual way.

Birch is a difficult wood to stain on account of something in the wood acting upon the stain, or most of the stains, and in a year or so the stain will assume a dirty brown hue.

Cherry.—This is a close-grain wood, of very fine texture, and of handsome color, yet is seldom finished natural, owing to the fact that by staining we get a much finer color effect, and the coloring is more uniform than in the natural wood. It is particularly adapted to mahogany imitation, it being the best wood we have for the purpose. In using water stain on cherry there is always danger of laps occurring, and when this occurs simply wet the edges of the laps with water and go over with the stain again. Apply stain freely, and be careful about air bubbles, which form. This wood needs to be made very smooth and free from dust, before staining, etc., for dust and rough places will make the work look very badly.

Burnt sienna makes a good stain for cherry, and vegetable stains, like alkanet root, dragon's blood, etc., and the frail aniline dyes, too, furnish fine stains.

The Age of Rosewood

About a century ago rosewood is said to have occupied a position similar to that held by figured mahogany today. It was not only an important item of cabinet work, but occupied what we would today term first place in cabinet woods. Even later when cabinet work developed in the United States rosewood continued as a favorite for high-priced pianos. It is still to be had in pianos and in furniture to an extent, but as compared with mahogany, Circassian and some other cabinet woods, rosewood is not anything like the conspicuous feature today that it was a century ago. There is no more radical explanation of why this is so than there is as to why black walnut had its run back in the early days. It was then neglected for a while and is now coming back into favor again. This would lead us to expect the revival of rosewood, too. In this event it is certain that rosewood would always find a welcome place in the cabinet world, but a measure of its ultimate popularity will depend more upon the interest shown in its promotion by those who are in a position to obtain rosewood timber and market the product, than upon anything else. That it is certainly a beautiful wood goes without saying. It is rather strange, therefore, that we have not been hearing more about rosewood during the last few years.

It was not unusual for the early-day pioneers to build log cabins with few or no nails, but the custom has passed away in practically every part of this country. An interesting case of such houses has been discovered in the Canadian Northwest. An entire village has been so built by Ruthenian immigrants, who brought with them the peculiar building methods of their native country. The houses are of logs, with thatched pitch roofs. Even the doors, which are composed of slender twigs, woven and laced together, swing on home-made hinges and are latched with wooden hasps. The floor is of hewn logs, unnailed, while the roof is a fabric of poles and cross-woven wheat straw, ten inches thick, laid with such skill and care that the builders expect it to last twenty years.

A hardwood by the name of mora is reported from the forests of British Guiana, that is a giant among trees and may be a factor in the cabinet lumber of the future. It is said to resemble very closely our native black cherry, to which it is botanically related, and it is thought that it will find considerable favor in the future.

Buy Direct
From the Manufacturer
We are their Salesmen

The
Saw Mill Owners
Sales Co.
322-323 Coristine Building,
Montreal, Can.

Branch Offices: Boston, New York, Watertown, Montreal, Quebec, Toronto

Ash
B.C. Doors
Birch
Basswood
Beech
Cherry
Cedar
Chestnut
Cottonwood
Elm
Fir Finish
Hickory
Hemlock
Maple
N.C. Pine
Oak
Poplar
Red Gum
Red Pine
Sap Gum
Spruce
Sycamore
Shingles
Tamarac
Timbers
Walnut
White Pine
Yellow Pine

We Solicit Your Inquiries

Woodworking News
From Coast to Coast

A sawmill, owned by Mr. Wilford Lepire, was destroyed by fire at Valcartier, Que., on July 23.

Mr. Henry Pringle, of the Pringle Company's planing mills, Belleville, Ont., passed away recently.

Mr. Jas. Anderson, who was a well-known wagon maker at Chatham, Ont., died recently in his sixty-fourth year.

The South American Cabinet Woods, Limited, has been licensed to carry on operations in the province of Ontario.

At Toronto on August 12 the planing mill of H. A. Marshall (507 Davenport Road) was destroyed by fire at a loss of $10,000.

The Canadian Hardwood Floor Company is a new Victoria, B.C., concern. Messrs. Axel Bockland and M. E. Peebles are the principals.

Mr. Hugh S. Brennan, Sr., a member of the lumber firm of M. Brennan & Sons, died suddenly at Brant House, Burlington, Ont., on July 31.

Work has started on the erection of a pulp mill at Bathurst, N.B., for the Bathurst Lumber Company, at an estimated outlay of $4,000,000.

At Dalhousie, N.B., a loss of $25,000 was sustained by the Dalhousie Lumber Company, Limited, in a fire which occurred in the lumber mills recently.

The firm of Rodgers & Fischer, boat builders, Winnipeg, is dissolving partnership. We understand the business will be conducted in future by Mr. E. W. Rodgers.

The County Council of Welland, Ont., is about to purchase furniture and fittings for the courthouse building in that town. The council secretary is Mr. Robert Cooper.

At London, Ont., the Quest club contemplates the purchase of club furnishings, including pool and billiard tables, club fittings, etc. Mr. W. J. McRoberts, 928 Colborne street, is the secretary.

The Watson Carriage Company, Limited, Ottawa, Ont., have decided to rebuild their plant which was destroyed by fire on July 8, involving a loss of $35,000, which latter was covered by $20,000 insurance.

The sawmill owned by Mr. Archibald McTavish, Cedarville, Ont., was burned down a few days ago, the machinery and a large quantity of lumber being destroyed. The extent of the insurance is not known.

In connection with industrial expansion at St. John, N.B., it is announced that the woodworking firm of Christie & Company have decided upon an enlargement of their factory premises at Courtenay Bay.

The sawmill at Rosedale, Chilliwack district, operated by E. C. Patterson Lumber Company, has been remodelled and the capacity increased to 25,000 feet a day. Orders on hand keep the plant running to full capacity.

Fort Frances, Ont., is to have a new box factory shortly, if the plans of an enterprising citizen materialize. It is understood that arrangements have been completed for the acquiring of a ten-acre site and a railway spur.

A Grand Rapids dry kiln has been installed by the Elmira Furniture Company, Elmira, Ont., which represents a new method in the science of lumber drying. The kiln first steams the boards, taking out the sap, thereby opening up the pores and allowing the stock to dry from the heart of

Three-Ply Wood for Immediate Delivery

We carry a large stock in our Toronto warehouse of three-ply

Rotary and Quarter-cut Oak, Mahogany, Ash, Etc.

for interior work, and "ALDERLITE" a cheaper wood, rotary cut in large boards without a joint for drawer bottoms, furniture backs, etc.

Write us for Samples and Prices.

C. DUPRE & CO., 266-8 King Street West, TORONTO
Sole Agents, Venesta Limited, London, England

Stewart-Greer
Lumber Company

Band Mills
Mangham, La.

General Offices
St. Louis, Mo.

We ship direct from our own mills. All of our stock is BAND SAWN, cut from large Virgin Timber and well manufactured. We are in position to make immediate shipment of the following dry lumber:—

Quartered White Oak
2 cars 4/4 No. 1 Common.
2 cars 4/4 No. 2 Common.

Plain White Oak
10 cars 4/4 1st and 2nd.
10 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

Plain Red Oak
10 cars 4/4 1st and 2nd.
10 cars 4/4 No. 1 Com.
10 cars 4/4 No. 2 Com.

Red Gum
15 cars 4/4 1st and 2nd
10 cars 4/4 No. 1 Com.

Sap Gum
15 cars 4/4 1st and 2nd.
10 cars 4/4 No. 1 Com.
8 cars 4/4 No. 2 Com.

Planking
25 cars 8/4 White Oak Bridge
15 cars 8/4 Red Oak Bridge.
6 cars 3½ x 10 Crossing.
1 car 3-in. Crossing.

Yellow Pine, Short Leaf
12 cars 4/4 No. 1 Com. Rough.
25 cars 4/4 No. 2 Com. Rough.

Miscellaneous
4 cars 6/4 Log Run Elm
4 cars 4/4 Log Run Sycamore.
1 car 4/4 Log Run Ash.

Archer Lumber
Company

HARDWOOD LUMBER

Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards 28718
4/4 18 in. and up Panel 33905

Good Steel, Carefully Manufactured, Scientifically Tempered

Our **GLUE JOINT CUTTERS** Make a Perfect Joint.
MILLED SHAPER CUTTERS—Any Size or Any Shape. Ask for quotations.

GALT KNIFE COMPANY, LIMITED 99 State Street, Galt, Ontario

the board. This is claimed to be the only method of drying lumber so that it will not swell or warp, but retains its actual dimensions as the life of the wood is taken out. This is said to be one of the strongest guarantees any furniture can have against open joints, warped tops, raised grain, or any other defect.

Messrs. Lang & Roddis, who have been operating a small sawmill at South Sumas, near Huntingdon on British Columbia Electric Railway, will shortly proceed with the erection of a larger mill, which will occupy the same site.

Mr. J. E. Baechler, of Goderich, Ont., is contemplating the erection of a furniture factory in that town. It is proposed to submit a by-law to the ratepayers asking them to approve of a fixed assessment and a loan of $25,000.

A loss estimated at about $500,000 has been sustained by Messrs. Gilmour & Hughson, through the destruction of about seven million feet of lumber in a fire which broke out in their sawmill at Hull, Que. The loss is partly covered by insurance.

In connection with the opening of a business college at Peterborough, Ont., early in September, a contract will be given out shortly for the supply of desks and other office furniture and fittings. Mr. E. S. Hudson, Oriental Hotel, Ottawa, is the owner.

A new planing mill, fitted with up-to-date machinery driven by individual motors, is to be erected in the near future for the Windsor Lumber Company, Windsor, Ont. It is said that the mill will be erected as soon as the hydro-electric system is in use.

A New York syndicate is said to be contemplating the building of pulp and paper mills at Alma, Que., at an approximate outlay of $4,000,000. They also contemplate developing electric power at Alma and erecting mills at Janquieres, some twenty miles distant.

With other woodworking industries passing through a period of depression it is satisfactory to find that Amherst Pianos, Limited, Amherst, N.S., a company only in its second year, is doing well. A newspaper report states that the plant is working over-time in the output of pianos.

From Wellington, B.C., comes the report that the Wellington Lumber & Trust Company are now making surveys for a saw-mill to have a capacity of 200,000 feet for 24 hours. Additional works include a box factory, brick plant, paper and pulp mill and electric light and power plant.

At Brockville, Ont., the Cossitt Manufacturing Company, Limited, makers of kitchen cabinets, etc., sustained a loss on the building of about $5,000, and on the contents of $3,000, in a recent outbreak of fire. The plant is said to have carried $160,000 insurance. The owners will probably rebuild.

Messrs. Maley & Wertz, the large hardwood manufacturers at Evansville, Ind., have contracted with The Standard Dry Kiln Company, of Indianapolis, for the installation of two large drying rooms. Another Evansville concern, the E. Q. Smith Chair Company, is also putting in the Standard dry kiln. This plant will have a single-room Standard outfit, 75 x 20 feet, of the latest fireproof type.

Mr. R. M. Hamilton, who is well known to the trade, and for many years occupied the position of General Superintendent of the McGregor Gourlay Company Works at Galt, has been appointed Works Manager of the Canada Machinery Corporation, Limited, with supervision of the manufacturing departments of their various plants. His headquarters will be at Galt, Ont.

The Grand Rapids Veneer Works have obtained a contract from Messrs. J. R. Eaton & Sons Company, of Orillia, Ont., for eight fireproof box kilns of the latest type. The firm regard the contract with special gratification in view of the fact that it proceeded from an exhaustive test, covering Canada and the United States, made by Mr. Eaton. Messrs. Eaton & Sons Company are building a large tile planing and interior finishing mill which will be up-to-date in every particular, and the purchase of the kilns was based entirely upon the principle of efficiency.

The Central Veneer Company, of Huntingdon, West Va., will continue its operations as usual, notwithstanding the death of the late president, Mr. W. J. Seiber. The plant covers an area of four acres of ground and has a daily capacity of one car load of lumber. We understand it is the intention of the new management to perpetuate the memory of their late chief by following strictly the sound business principles laid down by him. The late Mr. Seiber has filled the position of Mayor of Huntingdon for nine years and at the time of his death was a director of the Central Banking Company and also of the American Bank & Trust Company.

For Sale

Exhaust fan, dust collecting outfit; also furniture polishing machine.

LUCAS & SON,
Bridgeport, Conn.

7-8

PATENTS

STANLEY LIGHTFOOT

Registered Patent Attorney

Lumsden Building (Cor. Adelaide & Yonge Sts.) **TORONTO, CAN.**

The business of Manufacturers and Inventros who wish their Patents systematically taken care of is particularly solicited.

PATENTS

Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO

Write for Booklet

7% INVESTMENT 7% PROFIT SHARING

Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.

Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

OVER 65 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &c.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.

MUNN & Co. 363 Broadway, **New York**

Branch Office, 625 F St., Washington, D. C.

WOODWORKING MACHINERY

More than 1,000 Second-hand Machines, Renewed and Guaranteed.

52 Lines of New Machinery the Largest Stock in the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc.,
1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

"Andrews" Dried Lumber IS BETTER LUMBER

"ANDREWS" Products Represent Perfection—Reliabilty—Results

"Andrews" Moist Air Lumber Driers

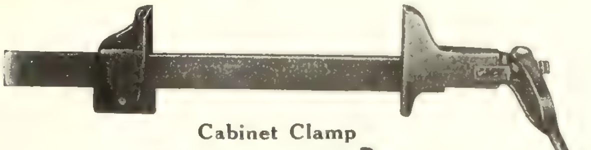
CONDENSING or VENTILATED

Perfect Transfer Cars
Perfect Dry Kiln Trucks
Canvas Dry Kiln Doors
Double and Single

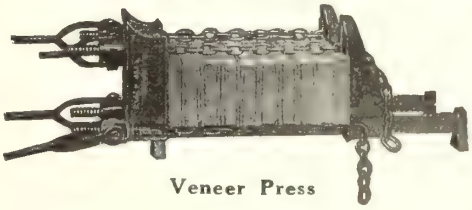
Write for Information

DRIER DEPARTMENT
The A. H. Andrews Co.
115-117 South Wabash Ave.
CHICAGO

"Pioneer" Moulding Sander
Power Veneer Presses

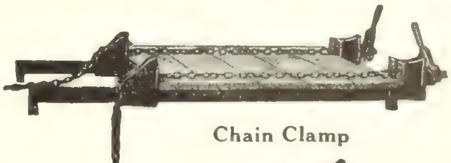


Cabinet Clamp



Veneer Press

Write for Catalogue and Prices



Chain Clamp

Black Bros. Machinery Co.
Mendota, Ill.

Column Clamp

Keiths LIMITED

Automatic Sprinklers

WILL YOU LET US SEND YOU AN EXPERT FREE OF CHARGE

to show you the best investment you ever made. Many Sprinkler Systems are paying their Owners 50% per annum return on the investment in reduced insurance premiums, and in addition are affording almost perfect protection against loss by fire due to interruption of business.

297 Campbell Ave., TORONTO
707 New Birks Bldg., MONTREAL

Associated Automatic Fire Sprinkler

B. C. Fir Timbers

and

Clear Finish Stock

Kiln Dried or Air Dried

Red Cedar Shingles

Write or Wire

W. G. Scrim Lumber Co.

Vancouver, B.C.

Canadian

Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer

603 Eastern Townships Bank Building,
MONTREAL

The Atlantic Lumber Co.

Manufacturers and Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers - **TORONTO**
Phone Main 6386

HOME OFFICE, BOSTON, MASS.

Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Steven & Jarvis Lumber Co.

OF

Eau Claire, Wisconsin

Offer You Standard Grades Well Manufactured

Ash

Rock & Soft Elm

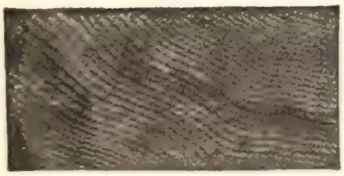
Hard & Soft Maple

Birch

Basswood

Stocks cut 4/4, 5/4, 6/4, 8/4, 10/4, 12/4.

Write us for prices delivered your station.



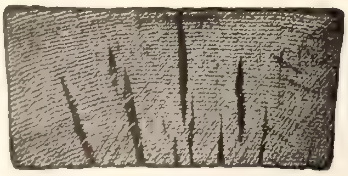
Every kind and form of

DRYING LUMBER

Grand Rapids Dry Kiln

QUALITY DRYING

Grand Rapids
Mich. - U. S. A.



Plain Sawed Oak

Mills in West Virginia and Kentucky

Wilcox & Knapp

Conneautville, Pa.

Quotations Cheerfully Furnished

INDIANA HARDWOODS

Young & Cutsinger

Manufacturers and Wholesale Dealers

Hardwood Lumber

Fine Figured Quartered Oak a Specialty. Prompt Shipments Guaranteed

Main Office - Evansville, Ind.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

J. V. STIMSON

All kinds of

Hardwood

Lumber

MANUFACTURED

HUNTINGBURG - INDIANA

Mills at ***Owensboro, Ky.,*** and ***Memphis, Tenn.***

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker." They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY
Cincinnati, Ohio

OAK

5 cars 4/4 No. 1 and No. 2 Common Plain

DIMENSION STOCK

We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT

4 cars 4/4 Sound Wormy

BASSWOOD

2 cars 4/4 Log Run

YELLOW PINE

5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller
Lumber & Veneer Co.

CINCINNATI -:- OHIO

Manufacturers of

Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.

CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR

Extra Wide 1, 2, 3 and 4 inch 5/8" PANEL STOCK
6" x 6," 7" x 7" and 8" x 8" Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati,

Uniform Oak - Uniform White Color - Uniform Soft Texture

Cut from our own tract of timber of 100,000 acres, by our own mills under our own personal supervision. We cut 200,000' of lumber every day

Send us your INQUIRIES.

The Mowbray & Robinson Company

MILLS: Quicksand, Ky.
West Irvine, Ky.
Viper, Ky.

Main Office
Cincinnati, Ohio

YARDS: Cincinnati, O.
Detroit, Mich.
Rochester, N. Y.
Brooklyn, N. Y.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO
—We make a specialty of—

Mills:
Kentucky Tennessee
W. Virginia

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of
DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chestnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.
Write us today and send us your inquiries.

Immediate Shipment

West Virginia Stock
Thoroughly Dry and Well Manufactured

2 cars 4/4 1s and 2s Plain White Oak.
4 cars 4/4 No. 1 Common Plain White Oak.
2 cars 4/4 No. 2 Common Plain White Oak.
3 cars 4/4 No. 1 Common and Better Plain White Oak.
Worm holes no defect.
1 car 6/4 No. 1 Common Plain White Oak.
6 cars 4/4 S. W. Chestnut.
2 cars 5/4 S. W. Chestnut.
2 cars 6/4 S. W. Chestnut.
1 car 8/4 S. W. Chestnut.
3 cars 4/4 No. 3 Common Chestnut.
1 car 4/4 No. 1 Common and Better Chestnut.
1 car 8/4 No. 1 Common and Better Chestnut.
2 cars 4/4 No. 2 Common and Better Poplar.
1 car 5/4 No. 2 Common Poplar.
2 cars 6/4 No. 2 Common Poplar.
2 cars 4/4 No. 2 Common and Better Birch.

We solicit your inquiries on special cut bill Oak.

Mill at Holly Junction, W. Va.

Write at once for Quotations. **The Price is Right.**

The Imperial Lumber Co.

Columbus, :-: Ohio.

DUHLMEIER BROTHERS

Mills—TENNESSEE ARKANSAS **Main Office & Yard—CINCINNATI, OHIO, U.S.A.**

OAK and RED GUM

OUR SPECIALTY

Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

At our Tennessee mill we are producing some choice Band Sawn

Plain and Quartered Red and White Oak, Poplar
Mahogany

Prompt Shipments and High Grades our Hobby.

Let us quote you on your requirements.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.

BAND SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS·
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.
Toronto Blower Company, Toronto.
U. S. Steel Tank & Pipe Co., Chicago.

BORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto.

BOX MAKERS' MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Machine Comapny, Woodstock, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

EDGERS (Gang)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons Limited, Galt, Ont.
U. S. Steel Tank & Pipe Co., Chicago, Ill.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Son, Baxter D., Winchendon, Mass.

FILLERS
German-American Stain Co., Grand Rapids,
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GAINING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE ROOM EQUIPMENT
Diehl Machine Works, G. M., Wabash, Ind.
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS (Knife)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Pyribil Machine Co., P., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Galbert-Zolar Lumber & Veneer Co., Cincinnati.
Imperial Lumber Co., Columbus, Ohia.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Mowbray & Robinson, Cincinnati.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Prendergast Co., Cincinnati, Ohio.
Sawmill Owners Sales Co., Montreal, Que.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Stewart-Greer Lumber Co., St. Louis, Mo.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.
Wilcox & Knapp, Conneautville, Pa.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.

KNIVES (Planer and others)
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

LUMBER
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
East St. Louis Walnut Co., East St. Louis, Mo.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Penrod-Jurden-McCowen Co., Brasfield, Ark.
Sawmill Owners Sales Co., Montreal, Que.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Thompson & Co., Lewis, Philadelphia.

MACHINE KNIVES
Berlin Machine Works, Ltd., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.
Walters & Sons, H., Hull, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.

PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

RESAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P. Q.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SANDERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.
Smith & Phillips Mfg. Co., Chicago.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Wood & Son, Fred, Toronto, Ont.

SAW GUARDS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pyribil Machine Co., P., New York.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

SAW JOINTERS
Diehl Machine Works, G. M., Wabash, Ind.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass

SCROLL SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Pyribil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
[illegible] Blow Pipe Co., [illegible]
Sheldons Limited, Galt, Ont.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRINKLER EQUIPMENT
Keiths, Limited, Toronto.

SPRAYING APPARATUS

De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS

German-American Stain Co., Grand Rapids, Mich.
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE

Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS

Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS

Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS

Berlin Machine Works, Ltd. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES

Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

TRIMMERS

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER

Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER

Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

VARNISH SPRAYER

De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES

Ault & Wiborg Company, Toronto.
German-American Stain Co., Grand Rapids, Mich.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS

Acme Veneer & Lumber Co., Cincinnati, Ohio.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dupre & Company, C., Toronto.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)

National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Talbot-Zoller Lumber & Veneer Company, Cincinnati, Ohio.
Thompson Veneer Co., W. T., Edinburgh, Ind.

VENTILATING APPARATUS

Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)

Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Diehl Machine Works, G. M., Wabash, Ind.
Perrin & Company, Wm. R., Toronto, Ont.

VISES

Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY

Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WINDOW FRAME MACHINERY

Smith & Phillips Mfg. Co., Chicago, Ill.

WOOD FINISHES

German-American Stain Co., Grand Rapids, Mich.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES

Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD SCREWS

Robertson & Company, P. L., Milton, Ont.

YELLOW PINE

Prendergast Co., Cincinnati, Ohio.

"Cabinet-Making"

For the Worker in Wood, the Successful Teacher
and the Ambitious Student.

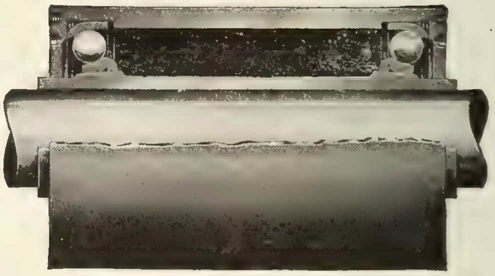
By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room.

The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS GLUE

(VEGETABLE)

SETS—STICKS—STAYS

Vegetable Glues differ as do animal glues.

Don't take any chance.

Start right—with the Atlas.

We are willing to show you.

WRITE NOW.

National Process Company
Manufacturers
Address Dept. C. Indianapolis, Indiana, U. S. A.

Absolute Control

of the drying elements—heat, humidity and circulation of air. It's this **absolute control** that has made The Standard Moist Air Kiln so completely successful in drying **all varieties** of HARDWOODS, without exception.

It's simple and easy to regulate the drying conditions so as to perfectly suit the requirements of **your** product. Write for the catalog. Address: The Standard Dry Kiln Company, 1560 McCarty Street, Indianapolis, Ind.

PERKINS
VEGETABLE GLUE

Is better than any glue made for built-up-stock and veneer laying.

It is applied without heat and does away with heat in the glue room.

It is being used by many of the largest manufacturers of high-class furniture in this country.

We can save you 20% of your present glue bills and give you better work besides.

If you are interested or doubt anything we have said, drop us a line. We will send you full particulars and give you the names of some of our customers—in the same line as you—who will be glad to give you their frank opinion.
Go into this matter right now, while you think of it.

It's worth investigating

Perkins Glue Co
809 J.M.S. BLDG.
SOUTH BEND
INDIANA

The pleasures of the seashore can't compare with the pleasures of getting back home.

Home joys are greatly enhanced by high quality furniture.
The crowning touch to quality furniture is the finish.

Manufacturers: Don't think so much about the dealer; aim to make your furniture appeal with force to the final purchaser.

You cannot miss the mark if you use

Marietta Spartan Art Wood Stains

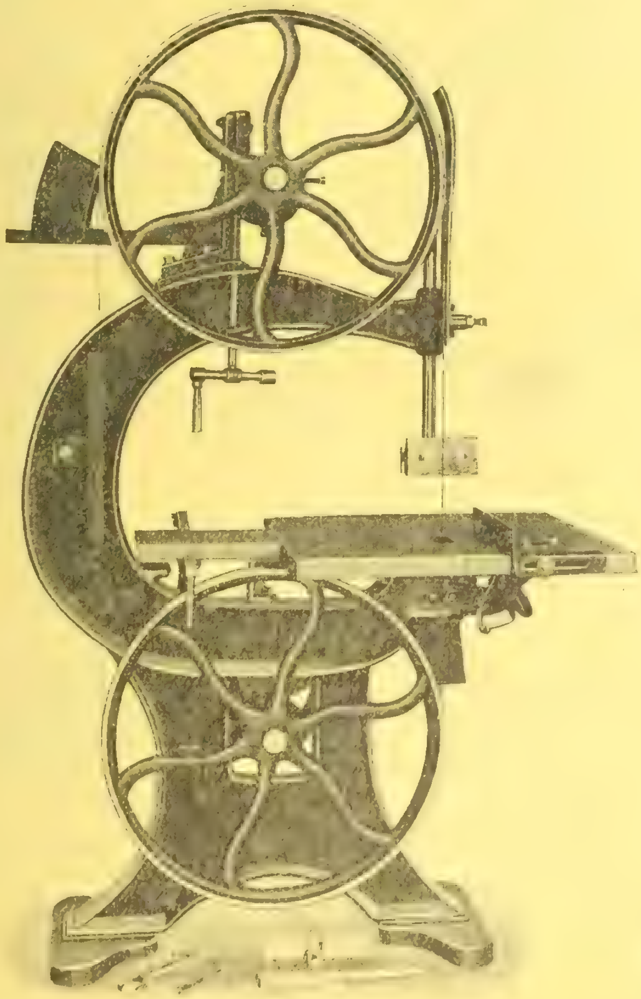
"The Stains made with brains"

Write for sample panels of our 1914 Process
Non-fading Mahogany Stain.

The Marietta Paint &
Color Co.
Marietta, Ohio.

Canadian Woodworker Essay Competition—See Page 7

CANADIAN WOODWORKER and Furniture Manufacturer



The Petrie Ideal Bandsaw

30" Wheels

Iron Tilting Table

Furnished complete with 3/8" Blade, Brazing-Tongs, Clamp and Wrenches

Our Special Price $80.00

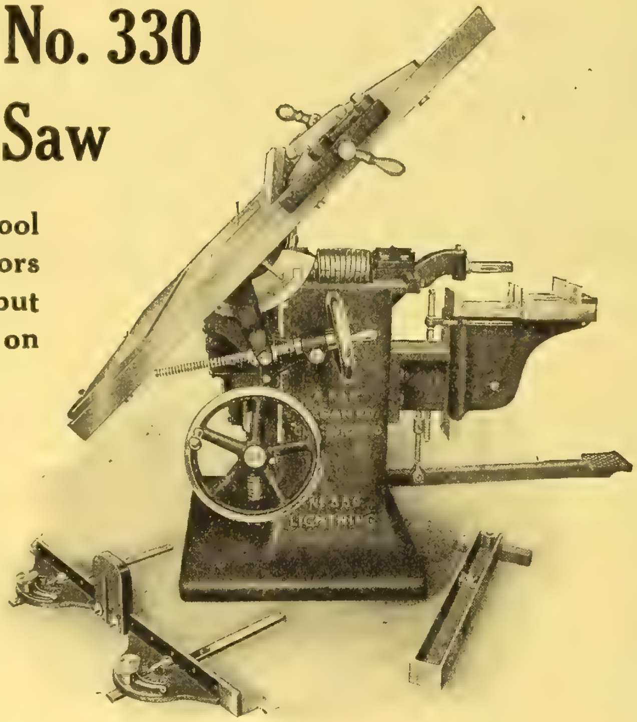
Everything in Machinery.
May We Send Our Illustrated Catalog?

H. W. PETRIE, LIMITED
TORONTO, ONT.

Volume Fourteen TORONTO, SEPTEMBER, 1914 Number Nine

Three times as much work without extra effort on a FAY-EGAN "Lightning" No. 330 Variety Saw

This new improved tool has enabled operators to triple their output without extra effort on their part.



No. 330 with Hollow Chisel Mortising and Boring Attachment.

Would it mean anything to you to Triple your Output—Triple your Profits? Furniture, carriage and implement factories, variety and carpenter shops are using the 330 with great satisfaction.

ALL ADJUSTMENTS
are quick acting and self-locking in any position. Micrometer set insures absolute accuracy of work.

COMPLETE SET OF FENCES
for bevel ripping at any angle, plain ripping on either side of saw and miter sawing give wide ranges.

THE No. 330
is a profitable addition to any wood shop and when fitted with Hollow Chisel Mortising and Boring Attachment makes a highly efficient Woodworker—in fact, it has been called a "whole woodshop in itself."

This machine merits your investigation—write to us today and we will send Bulletin R-12 and quote prices as fitted to your work.

J. A. FAY & EGAN COMPANY

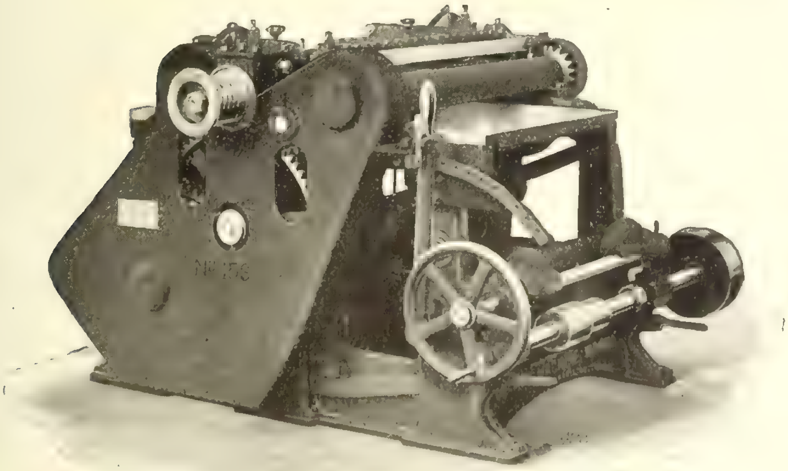
153-173 W. Front St., CINCINNATI, OHIO

"That's the machine I installed. It's the Berlin Cabinet Surfacer with round heads and thin knives.

"I bought it because it does the fine, smooth planing we require at double the speed of our thick-knife surfacer. Buying this Berlin machine saved me from putting in another of the old type and running two surfacers instead of one.

"Our experience shows that the latest style Berlin machines reduce our cost of production and at the same time maintain our standard of high-class work. Judging by our experience it would pay any factory to install a

BERLIN CABINET SURFACER



Profit by the experience of this and other factory men who have installed the Berlin thin knife round cutterhead cabinet surfacer. They have reduced both their surfacing and sanding costs. And the quality of work performed has been raised at the same time.

Where stock is worked in short lengths have your Berlin cabinet surfacer equipped with hopper feed. That will assure the maximum production, the finest work and the lowest cost.

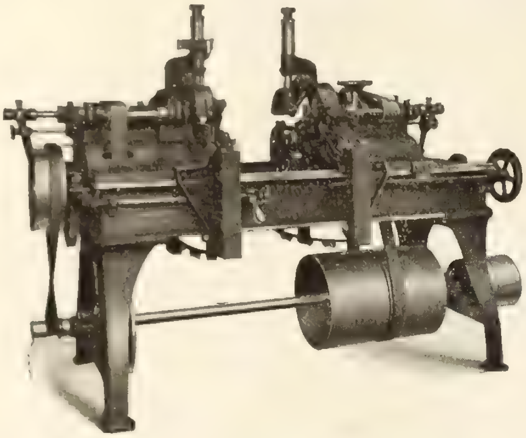
This is a matter to investigate without delay. To begin with ask for descriptive circulars.

Berlin Machine Works, Hamilton, Ontario

Largest manufacturers of wood-working machinery in the world

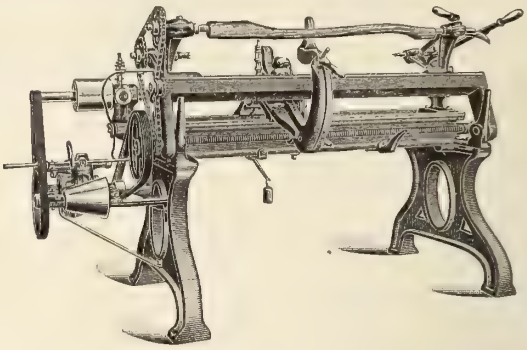
U. S. Plant - Beloit, Wis.

Better Spokes and More of Them



The new Nash Spoke Machine for equalizing and chucking tenon will help you improve product and cut cost.

J. M. NASH, Milwaukee, Wis.



Once **tried** always **used**

The Ober Handle Machinery

Turning Lathes, Sanders, Shapers, Rip and Cut off Saws, Bolting Saws, etc., for making handles of various kinds

Neckyokes, Spokes, Wiffletrees, Ball Bats, Table Legs, Spindles, etc.

Write for free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS, O., U.S.A.

THIS MAN IS ECONOMIZING

He is getting clean, smooth, uniform results, he is saving time and paper. He is sanding chair parts using

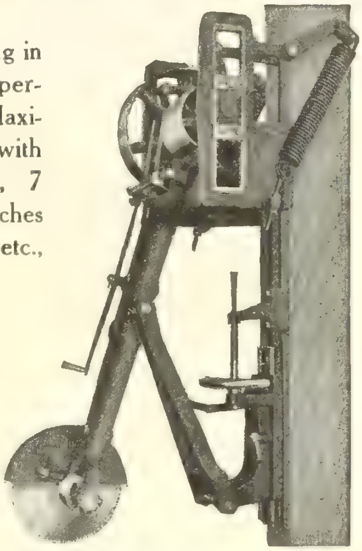
CARBORUNDUM BRAND GARNET PAPER

It cuts clean and fast—the paper is uniformly coated and the grains stay on. Carborundum Brand Garnet Paper cuts the cost of sanding.

Samples will gladly be sent upon request

THE
CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.

PRYIBIL No. 5 Parallel Saw and Groover



This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

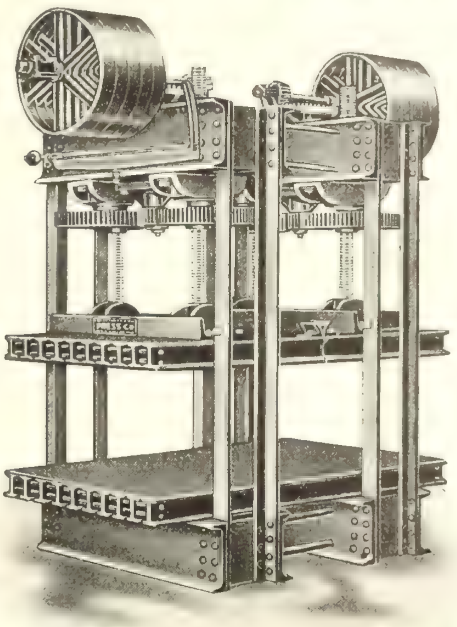
P. Pryibil Machine Co.

512-524 W. 41st St., - New York City

Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

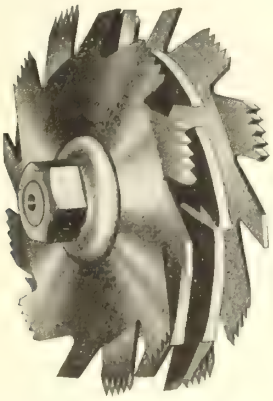
If interested in Woodworking Machinery, Write us.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL



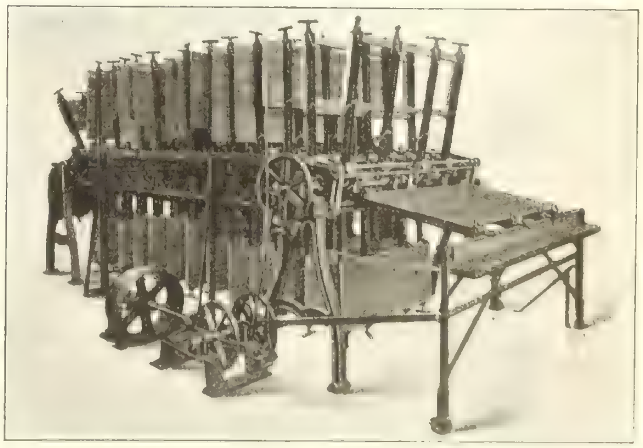
Patented Nov. 29, 1890
July 19, 1912

A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co. Toronto — Canadian Agents — Williams & Wilson Montreal

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

I AM THE MAKER
of the
Billstrom Gluing Clamp Carrier



Over 250 in successful operation in the United States, Canada, England and Germany.

Let me tell you where you can see it in operation.

Then ask the user what he thinks of it.

It is the best carrier on the market today. One of the largest manufacturers in America bought one last March on 30 day trial. He now has six in use. Drop me a line and I'll send you the names of the nearest Canadian users, and at the same time give you my special proposition.

NELS J. BILLSTROM
1315 Tenth St., Rockford, Ill. U. S. A.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

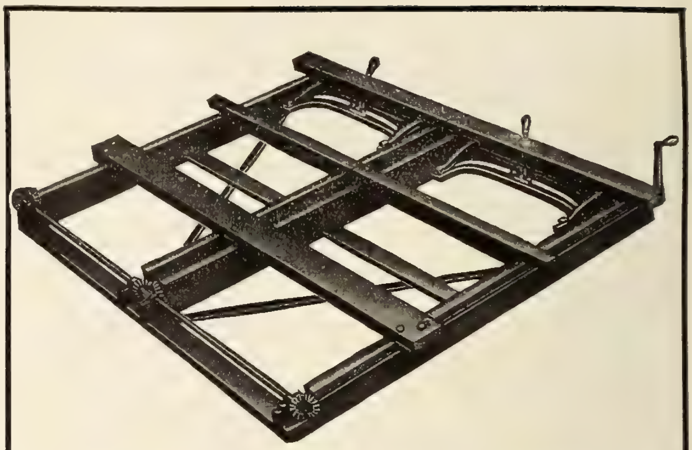
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, Nicholls Building, Toronto, Canada.



GRAND RAPIDS

Dependable Factory Furnishings

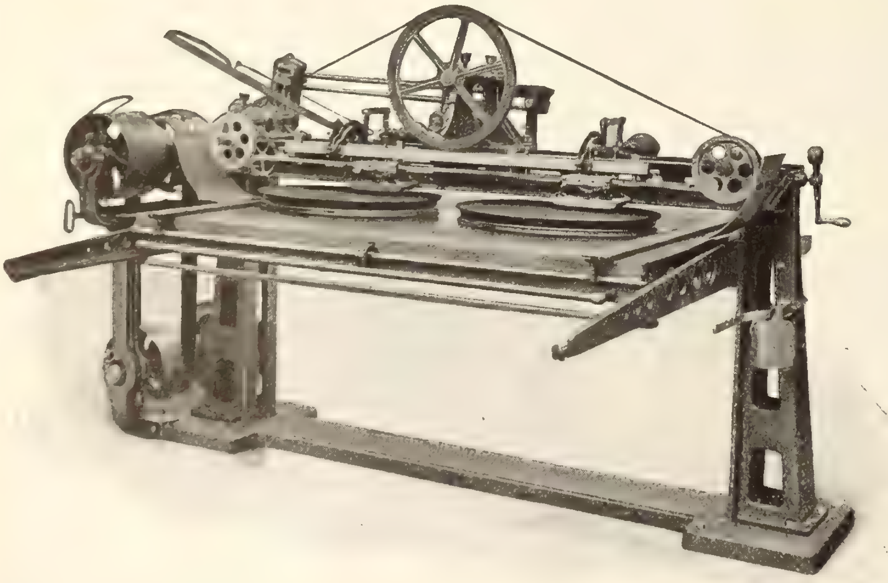
Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.

1456 Front Ave. Grand Rapids, Mich.

Moore Universal Rubbing Machine



The labor saving advantages of this machine are apparent in the accompaning illustration.

The action of a flexible guiding bar ensures a uniform finish throughout. Any required amount of pressure is obtained by an automatic device on the machine.

The accomodation of this machine is for cases up to 39 inches high or stock 6 feet by 8 feet.

The floor space required is 10 ft. x 10 ft. for the 8 foot machine and 10 ft. x 12 ft. for 10 foot machine.

May we send you literature?

CURTIS MACHINE CORPORATION, Jamestown, N. Y.

September 30th

is the date that the article for the October Competition must reach the Editor. Do not forget it. Send in your contributions.

Best Two Essays

on

Subjects of Practical Interest to the Trade

First Prize $20 ***Second Prize $10***

The following must be regarded as the conditions of the competition:

1.—Competitors shall be engaged in some branch of practical woodworking in the Canadian trade.

2.—The subject of the essay shall be at the selection of the competitor, preference being given to topics affording a solution to some practical problem of general interest to the trade or constituting a "short cut."

3.—Drawings (if any) may be sketched roughly, in which case they will be re-drawn at the office of the Canadian Woodworker. Preference will be given to drawings executed neatly in Indian ink.

4.—Essays (not to exceed 1,000 words) shall be written or typed on one side of the paper only, leaving ample marginal space.

5.—Articles for the October issue competition must reach the Editor not later than September 30.

6.—Awards shall be made on the basis of practical interest rather than literary merit.

7.—The decision of the publishers in the matter of awards shall be final.

8.—The publishers reserve the right to publish the articles submitted.

To the Reader

Cultivate the habit of getting ideas. Then put your ideas into black and white so that you may remember them and contribute something to the greater efficiency of your trade as a whole.

Exchange methods with the other fellow.

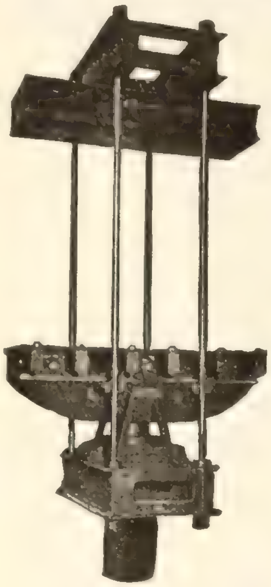
Learn to write. Concentrate upon clean-cut, descriptive English, written in short sentences. The exercise is helpful to the business man and helpful to the factory employee who means to get away from the bench some day.

Take a lead. The world's greatest need is leaders.

It is the winners in the competition of life that become leaders here and hereafter.

Address all communications to THE CANADIAN WOODWORKER, Nicholls Building, Toronto, marking your envelope in the lower left-hand corner, "Competition."

Hydraulic Veneer Press

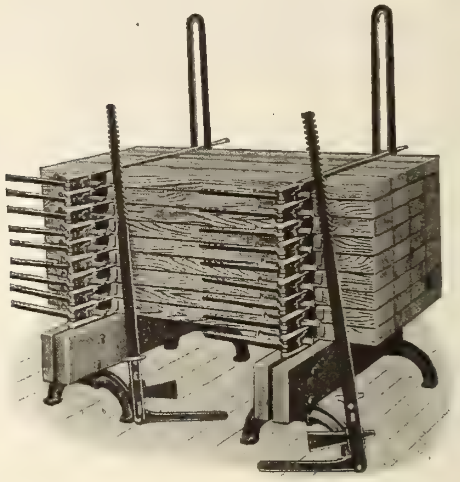


We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

CLAMPS THAT CLAMP



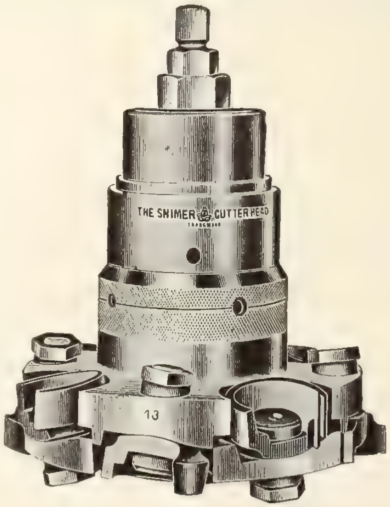
We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

Send for Complete Catalogue

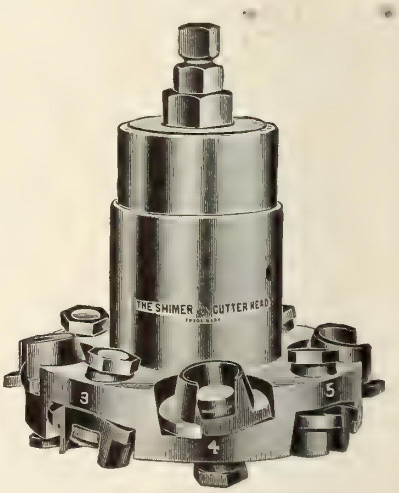
A. E. PALMER & SONS
OWOSSO, MICH.

Add to the Capacity of Your Mill

BY A SMALL OUTLAY FOR SHIMER CUTTER HEADS



The Shimer Limited with Expansion.



The Shimer Limited in solid section.

They save dollars by doing more work in a day with the same labor and power costs—**they save time** in getting started on a job, because they have built into them a "make-ready" which takes care of the "fitting and trying"—**they save the usual touching up** of the shape after each and every sharpening—**they save material** by nicely finishing many pieces which would otherwise go into the waste pile.

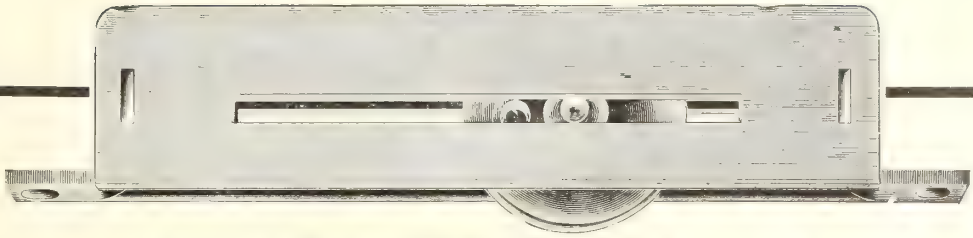
Flooring makers find these tools especially adapted to their work and that they are particularly useful in matching cross-grained, hard and knotty lumber—because of the peculiar construction of the bit seats, which are inclined to give the leading bit points a perfect clearance—because of the shape of the Bits and the fact that they work in pairs, and are divided into upper and lower series from a central line of cut, which divides the chip, assuring easy and smooth cutting. This part of the "make-ready" also produces an alternate and shearing cut which reduces to a minimum the tearing out tendency so prevalent in other cutters.

For Door, Sash and Blind work the Shimer Cutter Heads save all the hand fitting. The Shimer Cutters are ground or filed like the tooth of a saw without in any way altering the edge curves. As there is no changing of the patterns there is, therefore, no trouble in framing the door and sash parts. If you are doing any work at all in this line it will pay you to investigate these tools.

We also make Cutter Heads and Special Tools on the same general labor-saving principles for every class of wood-work. It takes a trial of them on your own machine to demonstrate fully to you their practical value.

Let us have measurements today for such of our tools as you would like to try 30 days.

Address: SAMUEL J. SHIMER & SONS, Inc., GALT, Ontario, Can.



ANTI-FRICTION SHEAVES

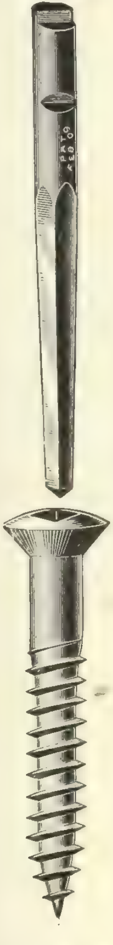
A sheave for a large heavy sliding doors, perfect in action, with the least possible wear. Steel pin travels with the wheel, on edge of best quality steel casting.

We can best convince you of the practicability of these sheaves if you will make a trial of them.

Manufacture a complete line of store fixtures and show case Hardware.

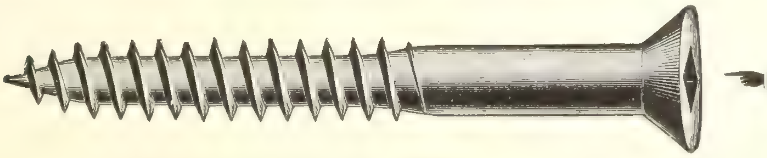
Reflector and Hardware Specialty Manufacturing Company

Western Avenue at 22 d Place CHICAGO, ILL.



ROBERTSON SOCKET HEAD

Wood Screws



See That Square Hole

Pat. Feb. 2, 1909

THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited

MILTON :: ONTARIO

GALT KNIFE CO. LTD.

Good Steel, Carefully Manufactured, Scientifically Tempered

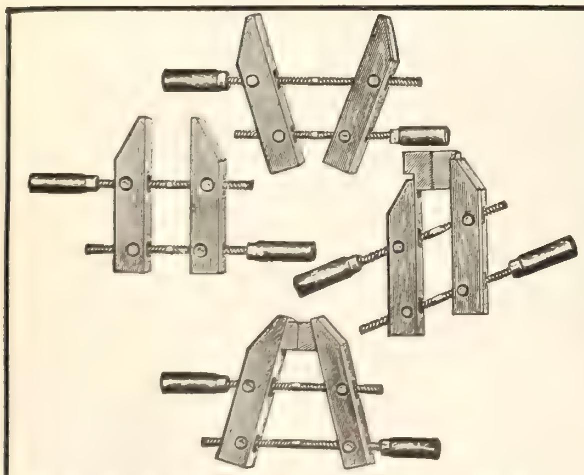
Our **GLUE JOINT CUTTERS** Make a Perfect Joint.

MILLED SHAPER CUTTERS—Any Size or Any Shape. Ask for quotations.

GALT KNIFE COMPANY, LIMITED 99 State Street, Galt, Ontario

Alphabetical List of Advertisers

Adjustable Clamp Company	10
Andrews Company, A. H.	51
Archer Lumber Company	52
Atlantic Lumber Company	52
Ault & Wiborg Company	39
Berlin Machine Works	3
Billstrom, Nels. J.	5
Black Bros. Machinery Company	51
Canada Machinery Corporation	12
Canadian Boomer & Boschert Mfg. Co.	5
Canadian Morehead Manufacturing Company	
Carborundum Company	4
Central Veneer Company	44
Central Veneer Company	46
Chapman Double Ball Bearing Company	58
Chicago Machinery Exchange Inc.	51
Cincinnati Veneer Company	45
Clark Veneer Company, Walter	44
Curtis Machine Corporation	6
Cyclone Blow Pipe Company	11
Dennison, Herbert, J. S.	50
DeVilbiss Manufacturing Company	39
Duhlmeier Brothers	55
Dupre & Company, C.	50
Fay & Egan Company, J. A.	2
Galt Knife Works	9
German American Stain Company	37
Goshen Veneer Company	45
Grand Rapids Hand Screw Company	6
Grand Rapids Veneer Works	52
Haughton Veneer Company	43
Hoffman Bros. Company	43
Huddleston-Marsh Company	45
Huther Bros.	5
Imperial Lumber Company	55
Invincible Blow Pipe Company	11
Kosse, Shoe & Schleyer Company	54
Kraetzer-Cured Lumber Company	49
Lightfoot, Stanley	50
Marrietta Paint & Color Company	60
Meakins & Sons	37
Morton Dry Kiln Company	11
Mowbray & Robinson	54
Nash, J. M.	4
National Process Company	59
National Securities Corporation	50
National Veneer & Lumber Company	44
Ober Manufacturing Company	4
Ohio Veneer Company	43
Palmer & Sons, A. E.	8
Penrod Walnut & Veneer Company	46
Perkins Glue Company	59
Perrin & Company	8
Petrie, Limited, H. W.	1
Powell-Myers Lumber Company	53
Prendergast Company	54
Pryibil Machine Company, P.	5
Reflector & Hardware Specialty Mfg. Company	9
Robertson Manufacturing Company, P. L.	9
Schmidt Company	39
Scientific American	50
Scrim Lumber Company, W. G.	52
Shawnee Lumber Company	55
Sheldons Limited	
Shiels & Company, Chas. F.	54
Shimer & Sons, Samuel J.	8
Simonds Canada Saw Company	
Spencer, C. A.	52
Standard Dry Kiln Company	59
Stimson, J. V.	53
Strong Veneer Company	6
Talbot-Zoller Lumber & Veneer Company	54
Thompson & Company, Lewis	44
Thompson Veneer Company, W. T.	43
Thompson Hardwood Lumber Company	55
Whitney & Son, Baxter D.	
Wilcox & Knapp	52



The Jorgensen Adjustable

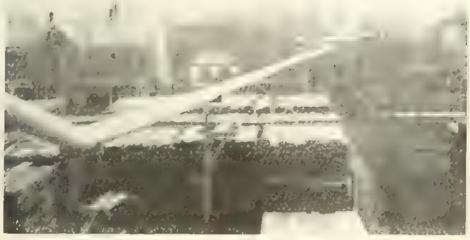
is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company

215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng., Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.

Slow Speed Low Power Shaving and Dust Collecting Systems



New Systems designed. Old systems corrected.
Long distance blows a specialty.

Trained Mechanics. We know how.

Consult our Expert

INVINCIBLE BLOW PIPE CO.

CHICAGO **176 George St., TORONTO**

TROEMROID SCALOMETER

For Testing Percentage of Moisture in Lumber

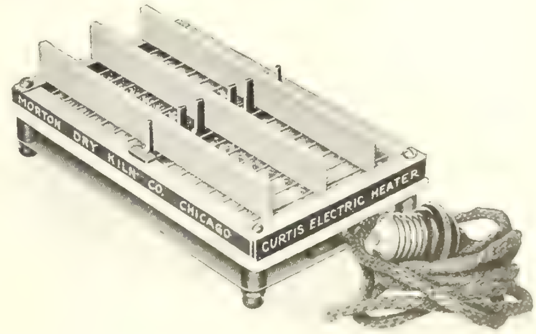
Model B Made in 3 different styles

Model A For testing air-dried or kiln-dried lumber. Range ½ of 1 per cent. to 30 per cent. Price **$20.00**

Model B—For all kinds of lumber from green to kiln-dry. Range ½ of 1 per cent. to 90 per cent. Price **23.00**

Model C—For green lumber only. Range 30 per cent. to 90 per cent. Price **20.00**

NOTE—Model A and Model C are constructed the same as Model B shown above, except they have only one cylinder and chart.



This cut shows a special Electric Heater to use in connection with the Troemroid Scalometer, for quickly drying the test pieces.

Price of Electric Heater **$3.00**

We furnish free with Scalometer and Heater our specially prepared table.

It shows the characteristics of 45 species of commercial woods.

GREEN weight per 1,000 board feet of each wood.

AIR DRY weight per 1,000 board feet of each wood.

KILN DRY weight per 1,000 board feet of each wood.

The percentage of moisture of each kind when green, when air dry and when kiln dry. The table also gives other valuable characteristics of each species.

Write for our new catalogue No. 5o of Dry Kiln Instruments.

Morton Dry Kiln Co., 20 W. Jackson Blvd., CHICAGO, ILL.

(Patented)

Cyclone Blow Pipe Co.

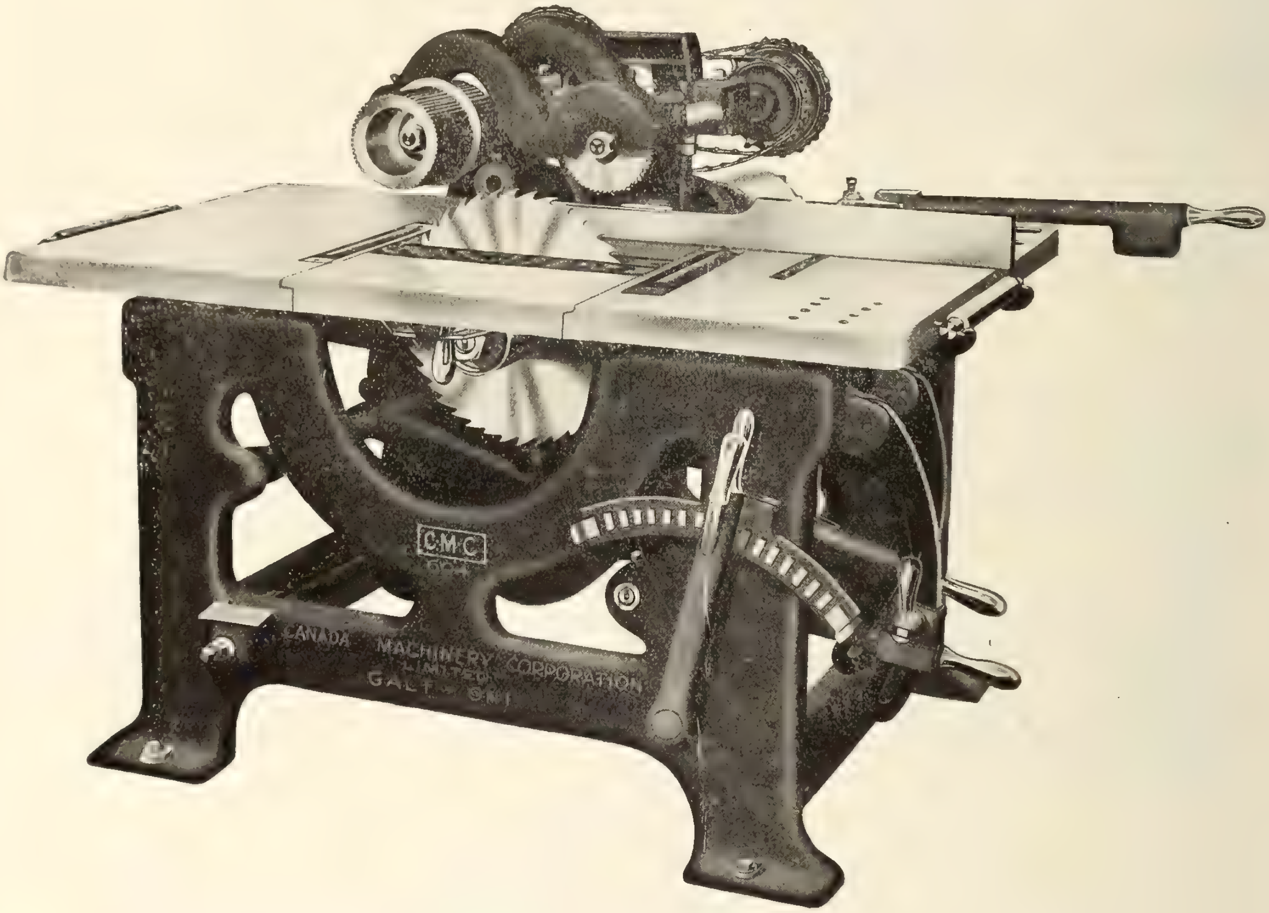
Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.

Power Feed C.M.C. Rip Saw



No. 604 Power Feed Rip Saw

SHORT STOCK can be easily handled in this machine as pieces **12** inches long are being successfully worked in them.

ADJUSTMENTS are all convenient to the operator and are easily made.

THE FEED is strong and can be quickly varied to suit the stock.

THE CONSTRUCTION throughout is simple, yet **rigid** and **strong**.

They are carefully and accurately built from the best of materials.

WRITE US FOR A COPY OF BULLETIN NO. 604 GIVING FULL DETAILS OF THIS SAW

CANADA MACHINERY CORPORATION, LTD.

GALT - ONTARIO

Builders of High Grade Woodworking Machinery

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring, woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.

Nicholls Building, Toronto
Phone Ade. 929

Authorized by the Postmaster General for Canada, for transmission as second class matter.
Entered as second class matter July 18th, 1914, at the Post Office at Buffalo, N.Y., under the Act of Congress of March 3, 1879.

Vol. 14 **September, 1914** **No. 9**

The Canadian Woodworker Essay Competition

COMPETITIVE effort, in every age, in every sphere of activity, in industry, in peace, in war—in everything, has been productive of the best that man has to offer. A man may pull off a creditable performance on his own account, but it needs the hot breath of the competitor hard upon him to stimulate the best in him. Those who win in the competition of life are not always the best men in their line, but they have the courage to come out—they win in open competition and they get the credit of being the best.

It is never difficult to find otherwise able men who shun the publicity of open competition. They are in the great army of nonentities. The world is full of them. This is a competitive age—a day when it is an important factor in success to have the courage to sound a reasonably loud call on one's own trumpet. It is a factor of success because it has to be done and nobody else will do it for you. It is a factor of success because by the very token of his nonentity the man who loses himself quietly in the crowd acknowledges his inability as a leader. Many a good man might have been saved from going to seed had he cultivated the habit of striving and perseverance induced by competitive effort.

It is with such reflections in mind that we direct once more the attention of our readers to the Essay Competition announced in our last issue. For the benefit of the uninitiated it may be said that we are offering prizes to the value of $30 ($20 and $10 for the first and second respectively) for the best essay on some subject of practical interest to the trade. We entered into the subject fully last month, devoting a complete page to the announcement of the competition and offering helpful suggestions editorially. Now it remains for us only to emphasize the closing date, **September 30.** There is ample time for the new competitor to start in and write a first-class article, and there is an opportunity for the one who is further advanced to check over his work carefully and put it into final shape.

The foreman of a department in a furniture factory told us the other day that his spare time was all taken up following the war and that he could not "get down to competitions." In principle this is wrong. There are hundreds and thousands of woodworkers in this country whose private responsibilities are such that they must attend to their work whether the Empire be at peace or war. There is a time and place for everything, and the man who has his eye on the future, in anticipation of the day when the war is remembered only as a nightmare of the past, will not neglect opportunities which will tend to his advancement.

This is the individual aspect. There are the wider aspects of the relation of such competitions to the progress of the woodworking industry at large, and of the part that they play in bringing out ideas and producing better workmen, but it is sufficient to mention these in passing. We return to the central idea, and that is the closing date, **September 30.**

Optimism from Toronto

THOSE who are inclined to give way to pessimism at this time should take a leaf from the book of a prominent Toronto man—the head of a large woodworking firm—with whom we were discussing conditions the other day. We asked him how he came to be so pleased with himself at a time when others were talking blue ruin. "Because," he replied, "I know that conditions are only about one-half as bad as some of my competitors have persuaded themselves that they are. I am not optimistic to the point of being foolish, but I have enough confidence in the British Empire and in the future of this country to be sure of the ultimate issue. As a matter of fact, in my opinion, it will not be long before there is a considerable increase in business activity."

"What is the basis of such opinion?" we asked.

"The basis of such opinion, or rather conviction," our friend replied, "is that the country must go ahead as consumers and in addition reap some of the business which will arise out of the fact that half a dozen European countries are practically out of the market as producers. Canada and the United States will be called upon to supply not only what they imported formerly but the deficiency of the manufacturing output of the European countries as well. Sooner or later there will be a greatly increased demand for labor both in Canada and the United States. When this comes about, every branch of industry will feel its stimulating effect."

We thanked our friend for passing on to us his optimistic ideas, and he laughed, and we laughed, and we both felt better for it. We had begun to think that the old order of things—"Laugh and the world laughs with you"—had been reversed.

Interesting Features of a New Woodworking Factory at Orillia

The Up-to-Date Plant of Messrs. J. R. Eaton & Sons Company, Limited

IN contradistinction to the strange attitude of those who see nothing but discouragement and dismay in present trade conditions and apparent disaster in future prospects, the example of courage and patriotic foresight which is being set by some woodworking manufacturers at the present time should be sufficient to dispel the spasmodic attacks of the most ardent pessimist. One of the most notable examples of enterprise is that of the J. R. Eaton & Sons Company, Limited, Orillia, Ont., manufacturers of general mill work, including hardwood flooring, exterior and interior finish.

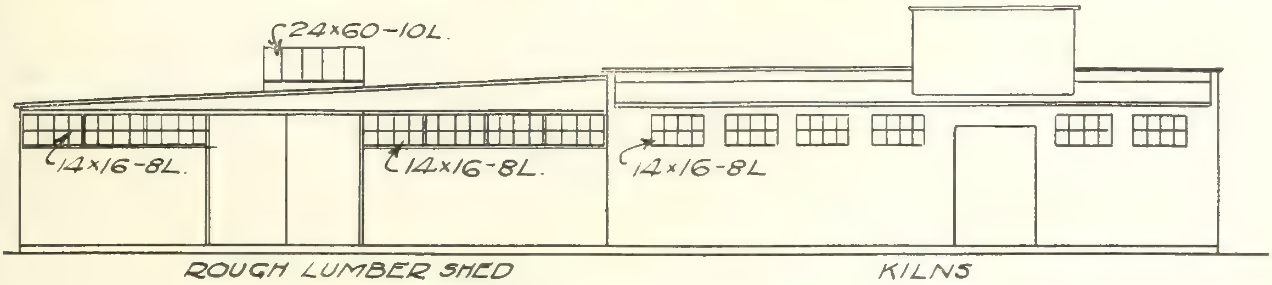
The company has under construction a modern and up-to-date factory building, which, when completed and ready for occupation next November, will be one of the finest woodworking plants of its kind in Ontario. Geographically, Orillia is peculiarly fitted for the development of its several industries. Situated on the Trent Valley Canal and served by three Transcontinental railroads the town has made a notable advance in recent years, the population itself having gained substantially in the last decade.

New Plant of J. R. Eaton & Sons, Orillia, Ont.

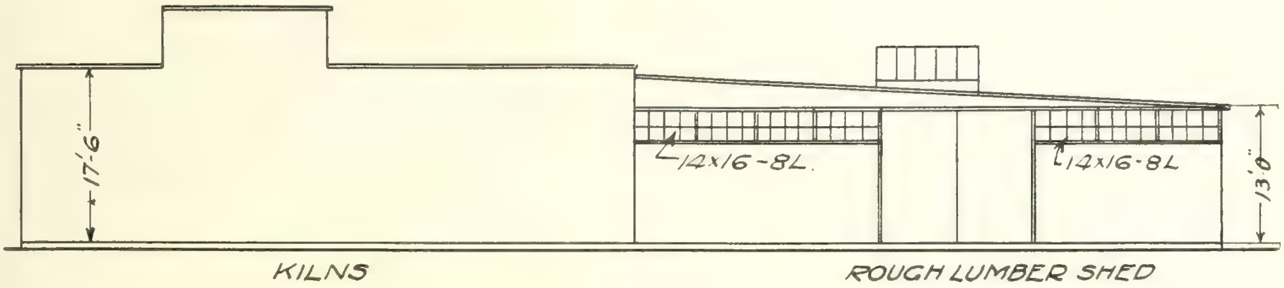
The present head of the company, Mr. J. R. Eaton, who is a native of Ireland, came to Orillia some thirty-two years ago and engaged in business as a building contractor. He carried out important contracts in the north country and to supply his own requirements he controlled a small planing mill. This in reality proved the nucleus of the present progressive industry with which his name is associated. Eventually giving up the contracting business Mr. Eaton decided to devote his entire energies to the development of his planing mills with what success the present operations in Orillia are an index. This took place about eight years ago. The plant was located on Andrew street, but was burned down two years ago, since when the business has been carried on in temporary premises. The company was incorporated in 1910, with Mr. J. R. Eaton as manager, and his two sons, Messrs. E. R. Eaton and J. H. Eaton, in association with him.

In May, 1914, the construction of the new factory on West street was commenced, the architectural and building work being carried through by the company itself. The site occupies an area of nearly twelve acres, has a frontage on West street of 500 ft. and a depth of 1,000 ft. The main building is 151 x 304 ft., one storey high, and full mill construction. The boiler and engine room, dry kilns and store rooms are attached to the main section of the plant by a covered way. The roofing is the Barrett specification felt and gravel, the walls are of Denison interlocking tile, manufactured by the Sun Brick Company, Limited, Toronto. This material was selected owing to the fact that it makes a perfectly dry, light wall, and also renders the building cool in summer and comparatively warm in winter. In designing the building great care was exercised in regard to the lighting and in this respect the plant will be fully equipped, adequate lighting from all four sides being provided. The flooring is of concrete, and the building generally is fireproof construction. In order to minimize as far as possible the risk of fire the company are installing the Sprinkler system, which has found favor with so many woodworking plants all over the country. The timbers used in the construction are British Columbia fir, the posts being pine and hemlock, dressed 2 in. by 4 in. on edge. Elaborate arrangements for the welfare of the employees will be made in the way of lunch and toilet rooms and other up-to-date features will include a modern draughting room.

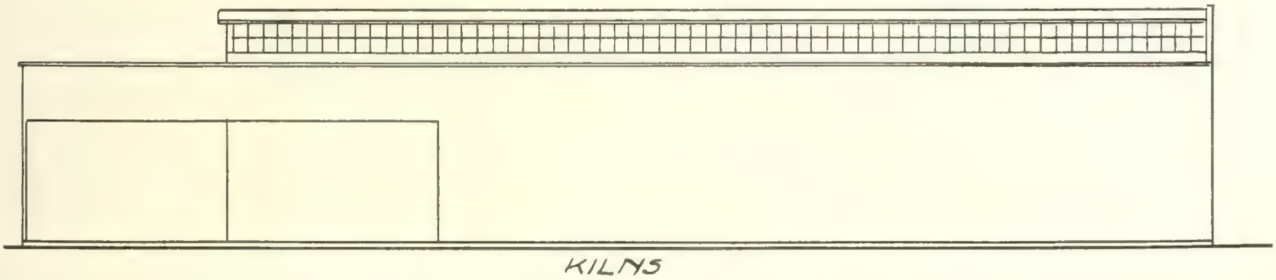
The most interesting feature of the new plant is, perhaps, the installation of a new type of dry kiln. In order to obtain reliable data at first hand a trip through the principal plants in the United States was taken by Messrs. E. R. and J. H. Eaton. The plant is therefore modelled on the latest and most approved lines, both as regards structural features and efficiency of equipment. The problem of obtaining a dry kiln which would solve the difficulty found hitherto in regard to variations in wood necessitated the making of exhaustive tests, both in Canada and the United States,



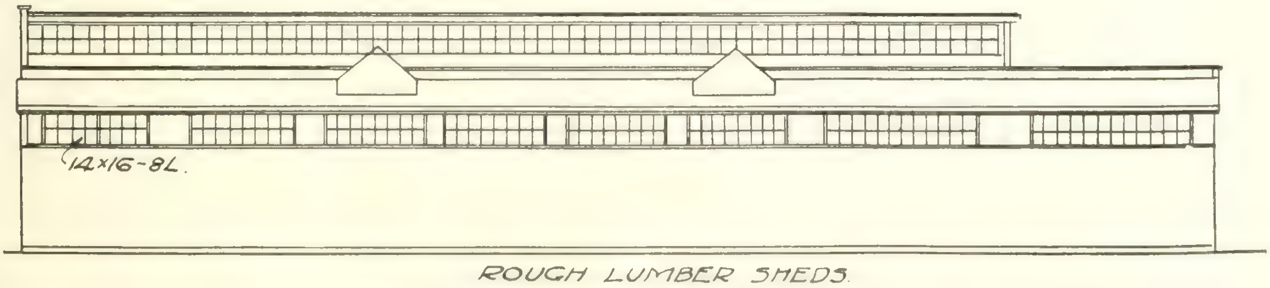
EAST ELEVATION



WEST ELEVATION



NORTH ELEVATION



SOUTH ELEVATION

Sketch plans of the new factory of Messrs. J. R. Eaton & Sons Co., Limited, Orillia, Ont. The various illustrations shown are suggestive of a type of construction which is coming into increasing favor in woodworking plants. The facilities provided in the way of efficient lighting, and of having operations conducted on one floor are important factors.

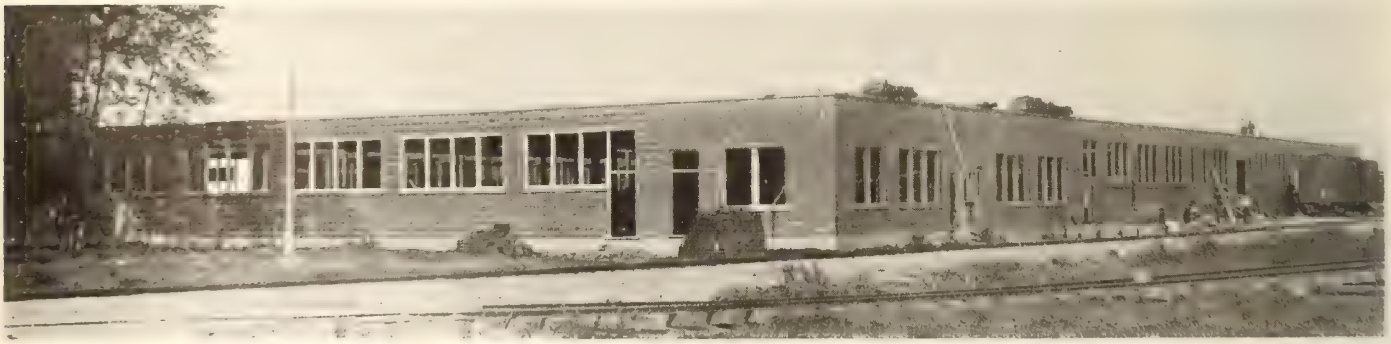
Dry Kiln under construction at the J. R. Eaton Company's plant.

The result was the adoption of the box or pocket type of kiln, and the Grand Rapids Veneer Works, Grand Rapids, Mich., were given the order for the supply of a battery of eight fireproof box kilns of the latest type of construction. The Grand Rapids Veneer Works are the patentees and manufacturers of the well-known Grand Rapids lumber drying process. The kilns are built of hollow tile and cement with a unique system of transfers and elevator, operated by electric power, which will enable the firm to handle their lumber at a minimum cost from the railway siding to the kiln, storage and factory. To explain briefly how the kiln is operated, the lumber is run in on a transfer car and discharged into the kilns. An important advantage claimed for the box over other types of dry kilns is the division of the former into eight boxes, four of which have a capacity of five cars each, the capacity of the other four being two cars each. By this means variations of temperature are avoided and different varieties of lumber, either hardwood or softwood, can be dried independently of the other. The kiln is 120 ft. by 62 ft., and when completed and in operation will undoubtedly be one of the most efficient lumber drying plants in the Dominion.

Adjacent to the kiln there is a large storage shed for drying and storing the lumber after it has emerged from the kiln. This building will be kept heated at a fixed temperature throughout the winter. By the adoption of this new process only one handling of the lumber will be necessary and, besides, the material will always be under cover. These buildings are situated at the north end of the factory. At the same end there is also a dressed lumber and freight shed provided for loading and shipping the finished product. The policy of the company is to adopt the most economical way of handling the material at the different stages of manufacture. With this object it is the intention to install high-speed machinery and several of the machines will be run by individual motors.

The Endless Chain Conveyor

Another unique feature of the plant will be the installation of the endless chain conveyor of shaving and waste material as fuel to the furnace. The company expect to have sufficient of this fuel to keep the mill running, therefore the economy which will result can easily be realized. The endless chain conveyor renders hand firing unnecessary and herein lines the value of the system. No air is blown into the furnace, the discovery having been made that the pre-

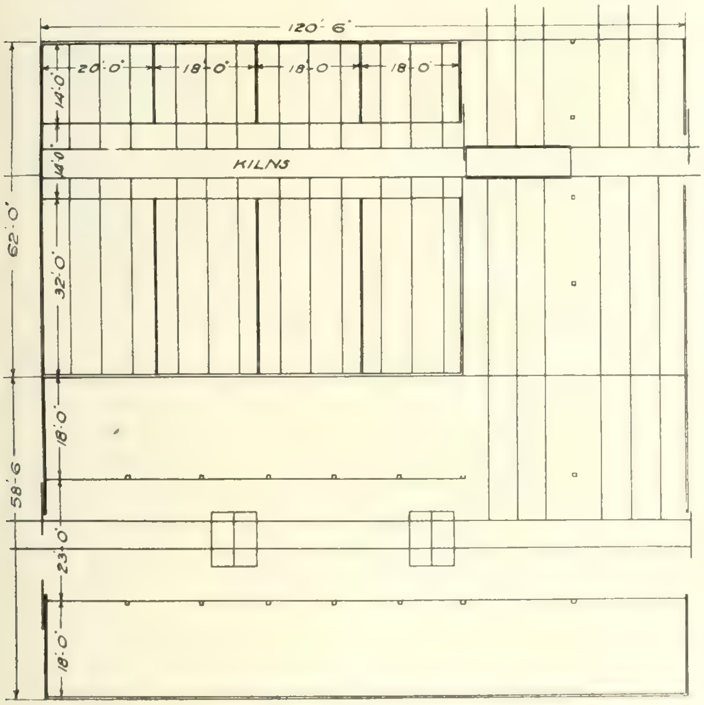


J. R. Eaton Company's main building in course of erection.

sence of air drawn in by the automatic blower has a deteriorating effect on the life of the boiler. This idea was obtained by Messrs. Eaton while on their trip in the United States, and it is claimed that this equipment is the first of its type to be installed in Canada.

The plant, when working at full capacity, carried about one million and a half feet of lumber, but with the added development made possible by the construction of the new plant it is expected that considerably larger quantities will be stocked. The transportation facilities can be gauged when it is stated that the company have about a mile of sidings on the G. T. R. Shipping and other facilities are therefore unexcelled.

The firm do all sorts of mill work, including exterior and interior finish and hardwood flooring. Woodwork for hotels, offices, apartment houses, stores, dwellings, etc., is manufactured, also veneer doors. Hardwood flooring is one of the firm's specialties, a considerable portion of their operations, including hardwood interior finish and architects' details, including panellings for walls, etc. An important item of the business for a number of years has been the manufacture of milling work in transit, this work being done mainly for wholesale lumbermen. The lumber is shipped in the raw state to the firm to be dressed, after which it is reshipped and eventually passes to the consumer.



Detail of dry kiln.

The firm use all the commonly-known Canadian woods, including pine, birch, maple, spruce, hemlock, basswood, cypress and ash. Imports, such as Southern pine, oak and mahogany are also used in the operations of the plant.

The power is supplied by a Wheelock engine of 225 h.p., steam being obtained from two boilers of 150 h.p. each. Electrical energy, both for power and lighting, will be generated on the premises. The company do a growing business with the whole of Canada as a market, practically ninety per cent. of the finished product being shipped out of Orillia.

Let's not merely have "safety first;" let us have as much as is practical of it all the time.

"Business as Usual"

There is nothing particularly warlike in the slogan, "Business as Usual," but the principles for which it stands are playing a part in the affairs of the Empire second only in importance to the operations in the actual theatre of conflict.

The vast resources which make ultimate British victory certain were built up by men whose close attention to business was as productive for Empire as the dauntless courage of military and naval heroes.

Considering the present safety of trade routes, and having in mind the glorious achievements of British arms during the first month of the war, there is no ground for panic. There is every encouragement for work and confidence.

The general consensus of opinion is that this war will lead to the permanent advantage of British trade. In this advantage Canada must obtain a proportionate share. Events move quickly. Opportunity comes and is gone. Already British and United States manufacturers are concentrating their attention upon the chances afforded them of establishing themselves in colonial and neutral markets in certain lines of trade in which our enemies have hitherto transacted large business.

This is a time of testing. False steps at this juncture will imperil us individually and weaken us nationally in the commercial world. The qualities we must produce under test are perseverance, confidence, and stability. Perseverance will arise out of a determination to stick to the guns of commerce; confidence will assert itself naturally; stability will be maintained unconsciously.

The Dominion Government and other authorities have committed themselves to the policy of continuing public works. These public works must be supplemented by private enterprise. Sacrifice at such a time is unavoidable. It will be felt least if distributed evenly throughout the whole community. With factories running and constructional operations in progress, the sacrifice will be reduced to a minimum.

The industry which this journal serves covers a wide field, and woodworkers—as men who control labor very largely—in common with others identified with constructional operations, have a great responsibility to meet at this time. Example counts for much. Pessimism spreads—so does optimism. Customers disposed to hold off work unnecessarily may be upheld by intelligent argument inspired by confidence and the spirit of "Business as Usual." Remember that every job put in hand now serves to increase the general measure of confidence and that every retrogressive step exercises an adverse influence upon the community at large.

Efficiency in the Sanding Room

The Second of a Series of Articles Dealing with the Sanding Cost Problem. The Author Establishes the Connection between Personality and Efficiency and Offers Suggestions Calculated to Guide the Superintendent and Foreman.

Specially Contributed by H. H. Allen.

IN the August number of the Canadian Woodworker, the writer, touching on the problem of how to obtain economical sanding at lowest reasonable cost, endeavored to show how judicious selection of equipment is necessary. Herein is shown how the problem is affected by the personality of operators.

Rarely do two workmen accomplish the same results in exactly the same way. This is true not only in the sanding room but in any industry where men are employed. Some men are more ambitious than others; some are more intelligent and grasp details more readily. Naturally the intelligent and thinking and willing workman will accomplish more and better work than the workman of lesser intelligence or the drone.

Some men take an interest in their work and attain a high degree of skill while others do their work in a mechanical manner. Some men like to work; others detest labor of any kind and work only because of necessity. We are all too familiar with the type of workman who works with one eye on the clock and the other on the boss. Considering the vast difference in the ability and deportment of working men it will be seen that the talent employed in the sanding room is an important factor in the problem under discussion. Even where the most capable sanding equipment is available the results that will accrue from its use, gauged in measures of efficiency, is a matter directly influenced by the workmen in charge.

It is not my purpose to argue high-paid men for the sanding room. What is necessary is skilled workmen. What will have to be paid such workmen to obtain their willing services differs widely in different sections of the country and is often a question with the workman himself. No man was ever over-paid who was paid what he was worth. Keep your best men on the payroll. Don't permit a man to leave your employ because an increase that he asks for and deserves is denied him. If a workman comes to you with a good argument as to why he is worth more money, give him your complete attention and act justly.

I have never seen a sanding room where skilled workmen were employed that wasn't the better for it. Better sanding is obtained, the machines receive better care and everything goes along smoothly because each man knows his business. Compare such a sanding room with one where inefficient workmen are employed, who by their inexperience affect the quality of the work, injure the equipment and drive the foreman almost to distraction with their demands for assistance on even minor details. The saving of a few cents each day between the labor cost of a poor workman and that of a good one is not a saving in any sense of the word, but a loss.

The sanding room must be in charge of a capable foreman. Select a man who is worthy of the position because of his ability—one who is every inch a man and who will deal with his men squarely; one who will show no favoritism. Select a man in whom you have every reason to feel that you can repose complete confidence and be governed by his decision in matters pertaining to the wages that should be paid the various men in his department.

The foreman should have a thorough knowledge of the firm's business, the degree of perfection its product approaches and its general policies. He should see that the machines in his department are arranged advantageously so that the handling of the work is facilitated, that they are kept in condition to do their work capably and are not subjected to careless treatment. Aisles should be kept free from obstruction and plenty of trucks should be available so that the men on the machines will never have to be kept waiting.

A capable foreman, unless he is handicapped by office restrictions in the way of a wage limit all too low to permit of his hiring capable men, may be depended upon to build up about him an efficient organization. He will weed out the drone and the workman who creates discontent. In departments where all three types of sanders are used he will place his most capable men in charge of the belts as these machines depend to a larger degree on the personal ability of operators than either the roll feed or endless bed machines. The latter two types, once set up, accomplish their work more or less automatically. Setting up, though, requires the services of a skilled workman. Care must be used in placing paper on the drums. The cut must be regulated so that the paper will give the best and most lasting service. The pressure rolls must be adjusted accurately and the rate of feed employed that will work best on the wood under consideration. As the endless bed machine handles a much larger volume of work than the roll feed machine more agile workmen should be placed in charge. All these matters the capable foreman will consider and their influence will be brought to bear in the arrangement of his working force.

In conclusion I want to touch on the necessity of maintaining harmony in the department. Use each man justly and make him feel that his work is appreciated. In your dealings with men you will learn that each has his own little pecularities. Wherever possible overlook them. Don't waste time trying to change customs that your workmen have been practising all their life, unless you have reason to feel that their conduct is affecting the efficient working out of your problem. In teaching a man a newer and better method don't make him think that his old method isn't worth considering at all. In every way avoid exciting his antagonism.

Maintain organization. See that the factory regulations are enforced. If small matters are handled in a slack way the effect will be felt throughout. Discourage in a firm manner tardiness and time killing. Make the men feel that their working for you is a very important and serious matter indeed. If the necessity arises for calling a workman down, do it in a manly way, pointing out where he is at fault, and appeal to his sense of reasonableness. Endeavour to create content throughout the department. A contented and willing workman will give vastly better service than one who is dissatisfied or one that feels that he is being driven. Do you, yourself, like to be driven? No, indeed. Neither do the men under you.

Installing the necessary equipment is the first step that makes for Efficiency in the Sanding Room. But to obtain satisfactory results we must go a step farther and employ skilled workmen to operate the machines. This is a truth that should command the attention of every manufacturer in the country.

Sticking Short Wide Stock and Glue Joints

By W. H. Rohr in the Woodworker.

THERE is always something new to learn about that invaluable woodworking machine, the outside moulder. I give here some problems and how I solved them since taking charge of a new 16-in. sticker in a large casket factory.

A number of difficulties were encountered when I first tried to stick short wide stock, but before I mention them let me describe the stock. For molded casket sides the stock is 1 x 14-in. and from 2 to 6 ft. in length. It is in the rough, glued up of random widths of 1-in. western pine and cedar. Often the pieces that make up a 1 x 14-in. vary as much as ½-in. in thickness and 2 or 3 in. in length. Practically all of the glued-up stock is uneven at the ends and varies as much as 1¼ in. in width. One side of the stock, however,—the face side—is fairly even and level; if not, it must be lightly faced on the jointer to prevent splitting in the machine.

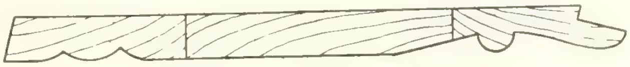
After being stuck this stock is mitered into sides, ends and corners for octagon-end casket shells. It must be stuck perfectly straight and the members of the mold match exactly, while the thickness and width are calipered to 1/32-in. I stick all my stock face down, and my first difficulty with this wide stock was to keep it up tightly to the inside fence the full length of the machine. Often stock would apparently be feeding alright, but on looking at the side heads I would find the outside head cutting 1¼-in., while the inside head was not touching the stock, although set to cut a full ⅛-in.

I went over the machine and put the bed and inside fence in perfect alignment. While a man can stick long, narrow or medium-width stock with his machine out of proper line, and obtain good results, it cannot be done with short, wide stock. Although the putting in line of the bed and guides did a good deal toward remedying the trouble, it did not entirely do away with it. I decided there was too much friction between the pressure bars and stock.

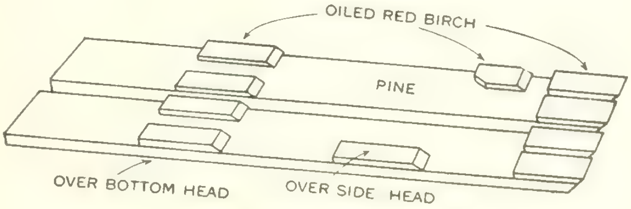
For stock so thin and wide (13/16 x 13-in. finished) a pressure bar or pair of bars must extend nearly the full width of stock, so to hold it in place for the bottom and side heads, I used two pieces, 1¼ x 5-in. x 4-ft. These, of course, rubbed their full width and length, thereby creating so much friction that the stock would crowd away from the inside fence in spite of the lead of the feed rolls tending to feed it tightly to the fence. I discarded these bars in favor of two pieces of 1 x 5-in. pine, with blocks of red birch, ½-in. thick, glued to them just where pressure was needed, and nowhere else, as shown in sketch.

It is really surprising the difference this made. I believe this is the best type of bar to use on anything wider than 4-in. With careful feeding I have no more trouble with stock leaving the inside fence or cramping around sideways when starting it into the rolls. The thick edges I feed to the inside and the projecting ends to the outside. I find that the springs at front of the machine, to hold stock in, are of little or no use on short, wide stock, that varies so much in width. When a wide piece starts to cramp around sideways, no spring will hold it. The friction must be reduced and the machine perfectly aligned, so the stock can travel through freely.

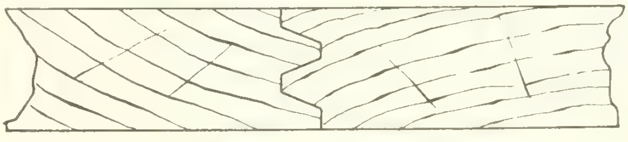
A great deal of gluing is done at this shop, and whenever there is a sufficient quantity of one width to warrant a set-up it is jointed on the sticker. I size to net width all stock which is glue-jointed. Part of the stock I surface to net thickness and part of it is left unsurfaced, to be stuck after gluing. Stock that is to be glue-jointed, but not surfaced to net thickness, I stick with a plain, square joint, using the two side heads for the joints and the top head to rough off extra-thick pieces or miscuts.



Detail of a Casket Side.



Pressurebar for Wide Stock.



Reversible Tongue and Groove.

Stock which is to be surfaced to net thickness in addition to jointing and sizing, I stick with the reversible tongue and groove joint, which most woodworkers are familiar with. This joint slips together easily, keeps the sides flush and even, takes glue readily from the power-driven roller and only requires one set-up at the sticker.

Probably the greatest obstacle in the way of making good glue joints on a sticker is the failure to get straight edges. After some experimenting I have succeeded in getting perfectly straight joints from rough lumber, provided the length is not more than seven or eight times the width. Beyond that proportion, 1-in. stock, if bowed or crooked, will spring slightly in the machine, but usually not enough to disqualify it [illegible] a glue joint on softwood. I have jointed thousands of feet of 1 x 4 in. x 6 ft. pine on the sticker and there was no case of joints coming apart.

To get the right kind of finish, all dust and dirt of sander work should be carefully brushed off before the finishing process starts.

The Varying Power Requirements of Woodworking Machinery

THE power required to drive wood-working machinery varies greatly under the different conditions of operation and classes of work. Some of the main factors in influencing the loads are: Design of the machine itself, power-fed machines differ more than hand-fed in inherent friction load. Speed at which the work is done, comprising feed and depth of cut. Condition of the machine and cutters. Kind of material. Machines handling but one kind of material may be motored for their ordinary load, whereas machines used for diverse operations must be equipped for their heaviest service.

The following data covering the motor sizes recommended for wood-working machines are based upon numerous tests as well as the data given by manufacturers. As a guide they should be helpful. Figures are for modern machines in normal conditions handling medium woods. Care should be taken to prevent overmotoring because of loss of efficiency and low power-factor affecting the generators.

Band Saws

All band saws possess considerable inertia and require motors with good starting torque. With resaws this condition is particularly true and motors should be capable of developing 1.5 times full-load torque at starting and have good overload characteristics. With alternating-current squirrel-cage motors high-resistance end rings give the desired starting torque in a satisfactory manner. Wound-rotor motors must have their rings protected and are not strongly recommended, the high-resistance squirrel-cage motor being simpler and more satisfactory.

Belted motors are recommended for most installations because of slow speeds of driven shafts. Low-speed induction motors are costly and have poorer characteristics than high-speed motors of same type. If self-contained equipment is desired the motor can often be advantageously geared.

Band Saws

Diam. of Wheel in inches	R. P. M.	Max. Depth of timber inches	H. P. of motor
42	400-500	20	5
38	450	16	5
36	500	16	5
36	400	14	3
34	500	12	3
30	500	12	3

Band Resaws

Diam. of Wheel in inches	R.P.M.	Width of Saw Blade inches	Max. depth timber inches	Motor H.P.	Motor R.P.M.
60	550	8	36	50	600
54	600	6	30	40	600
48	650	5	26	30	720
44	650	4	24	20	720
42	650	4	24	15	720
40	700	3	20	15	720
38	450	2	12	7.5	514

Add for jointing attachment on 48-in. saw, 7.5 h.p.

Band Rip Saws—Power Feed

Diam. of Wheel inches	R.P.M.	Max. depth timber inches	Motor H.P.	Motor R.P.M.
42	650	12	15	720
40	600	15	10	600

Add 2 h.p. for return rolls if used. Use high-resistance rotor preferably if alternating-current induction motor is used. For direct-current use compound-wound motors. Speeds given are for direct connection.

Scroll Saws—Hand Feed

Two h.p. motor required for ordinary saws of this type. If direct-connected a 900-revolutions-per-minute-motor is generally correct. Scroll saws operate with a reciprocating motion from a connecting rod, the saws being from 14 to 16 ins. long.

Circular Saws

Circular saws are not as much used for resawing as band saws, as they require more power, cannot run at as high speeds and waste more stock. They are cheaper, however. Splitting with circular saws requires from 15 to 20 per cent. more power than cross cutting, whereas band saws require about the same power for both.

Circular Saws

Max. Diam. Saw inches	R.P.M. of Saw	Capacity Horizontal inches	Capacity Vertical inches	H.P.
42	900	17		25
36	1,000	14		25
32	1,225	11	8	20
30	1,200	10	6	20
24	1,225	8	6	20

Circular Rip Saws

Max. Diam. Saw inches	Max. R.P.M.	Max. thickness stock inches	Feed feet per minute	H.P.
20	2,100	6	60-180	15
16	2,600	5	64-194	15
12	2,400	2	50-100	7.5

Hand-Feed Circular Rip Saws

Max. Diam. Saw inches	Saw R.P.M.	H.P.
14	2,700	7.5
16	2,400	10
20	2,000	15
24	1,600	15
30	1,250	20
36	1,000	20

Power Feed Gang Ripping Machine

No. of Saws	Max. R.P.M.	Diam. Saws inches	Feed Ft. per min.	H.P.
2	3,400	10	180	15
3	2,300	15	200	30
4	2,500	14	100 to 180	25
Power feed gang edger and ripper.				
8	2,500	14	90 to 200	35

Circular Cut-Off Saws

Max. Diam. Saw inches	R.P.M. of Saw	H.P.
14	2,700	5
16	2,600	7.5

Power feed cut-off saws are usually for heavy work in large amounts. They use 7.5 to 10 h.p. motor, depending upon the work.

For very heavy work use	20 h.p. motor.
For heavy work	15 h.p. motor.
For medium work	7.5 h.p. motor.
For light work	5 h.p. motor.

The third class is for ordinary work in most factories where stock 8 in. square is not exceeded.

The fourth class is for boards not thicker than 1.5 in. Motors for this work must be belted, the motor being mounted upon the swinging bracket of the saw frame.

Double Cut-Off Saws

Max. Diam. Saw Inches	Max. thickness timber inches	Motor H.P.	Motor Speed
16	4	10	600 or 900

Where work averages about 6.5 to 12 ins. cross section of cut at one end, a 5 h.p. motor is ample. This is the condition met in many plants.

Inside Molders

Max capacity, inches	Horsepower
8 by 4	25
10 by 4	25
12 by 6	35
14 by 6	35

Outside Molders

Max. capacity, inches	Horsepower
4 by 4	10
6 by 4	15
8 by 4	20
10 by 4	25
12 by 5	30
14 by 6	35

Stickers

Max. size timber	Horsepower
16 by 4	5
18 by 4	7.5
20 by 4	10

Jointers

Max. width timber inches	Horsepower
8	2
12	2
16	3
20	5
24	7.5
36	7.5

The above horse-power recommendations are based upon a miximum depth of cut of three-thirty-seconds in. If this cut is to be exceeded it would be advisable to increase the motor size to correspond.

Single Surfaces

Values here given are for medium heavy work where cuts of not more than ⅛ in. are taken. For planing-mill duty involving heavy stock and deep cuts the motor sizes should be increased about 5 h.p.

Max. widt timber, inches	Horsepower
16	7.5
20	10
24	10
30	15
36	15

Double Surfaces

Max. width timber inches	Medium work H.P.	Heavy Work H.P.
26	20	25
30	25	35
36	30	

Timber Sizes

For dressing timber to size, surfacing four sides simultaneously, the following figures are given. They apply to heavy service.

Max. size timber, inches	Horsepower
20 by 16	60
20 by 18	60-75
20 by 20	60-75
30 by 18	75
30 by 20	75

Drum Sanders

No. of drums	Size sander max. width stock, inches	Horsepower
1	30	10
1	36	15
1	42	15
2	30	20
2	36	20
2	42	20
2	48	20
3	30	20
3	36	25
3	42 and 48	30
3	54 to 66	35
3	72	40
3	78	40
3	84	50

Where material is sanded to size and full width of sander is used with panels fed continuously, add 5 h.p. to the motor sizes given above.

Tenoners—Hand Feed

Length of tenon, inches	Horsepower	
7	7.5	Single
7	10	Double

Shapers

For ordinary service on reversible single or two-spindle machines use a 5 h.p. motor. For extra heavy work such as in carriage factories, railroad shops, etc., use a 7.5 h.p. motor.

Scraping Machines

Max. width stock, inches …	12	26	30	42
Horsepower … … … … ..	2	3	3	5

Automatic Lathes

Max. diam. and length of stock	2.75 x 72	3 x 50	5 x 50
Horsepower … … …	10	15-20	20

Borers

No. bits … … …	1	1	2	3	4	8
Max. diam. bits, inches	1	2	.75	.75	.5	.5
Horsepower … … …	3	5	3	5	5	10

Chisel Mortising Machines

Max. No. Chisels	Max. size chisel square	Horsepower
1	0.5	2
1	0.75	2
1	0.75	3
1	1.25	5
2	1	3
3	1	5
4	1	5
5	0.8125	5
6	0.8125	7.5
7	0.8125	7.5

Planers and Matchers

For planing and matching timber at one operation.

Max. size timber, inches	Horsepower
9 by 6	[illegible]
15 by 6	[illegible]
20 by 6	[illegible]
24 by 6	45
26 by 8	[illegible]

Box-board matchers are similar to the above except that the work is much lighter. Hand-feed box-board matchers usually require a 7.5 h.p. motor, while power-fed machines require a 10 h.p. motor.

The Relative Merits of Wood and Steel in Office Equipment

By Henry Behring

FIRE prevention and protection have attracted many adherents during the past few years, and while the movement generally is a most commendable one, having in view the reduction of the enormous fire waste of this country, including the loss of many lives, a large number of the most enthusiastic advocates of fireproof construction and equipment are found to be actuated by purely selfish motives.

The average consumer, left to his own devices, would choose wooden equipment, because it is much the more attractive material. There is something warm and humanizing about wood that is not found in steel, which is cold and repellent, and unless the buyer were made to believe that steel is the only material which will protect his valuables from destruction by fire, he would in most cases refuse to install steel equipment in his offices.

Those who have been advocating wood equipment, even with the fire protection element in mind, have been charged with having the motive of self-interest to bolster their claims; but it is worth noting that an expert on office equipment recently had the following to say in a journal devoted to stationery and office devices, which certainly could not be accused of being prejudiced in either direction:

"The question of fire protection is more or less vital, and one that is made much of by the steel manufacturers, who state that their furniture won't burn. Unquestionably steel will not be consumed in a hot fire, but it can easily get so hot that the contents within will be destroyed, besides ruining the case for future use. Steel furniture will only become fireproof when it is built like safes, and this day is not in sight. Steel manufacturers say fire will not spread if steel furniture is used, and that wood will burn. This is true, yet the instances where portable furniture has been exposed to strong heat are practically confined to great holocausts which burned everything in their way, and which neither steel nor wood furniture was able to resist. Steel conducts heat; slow-burning wood resists heat; and if the latter has been fireproofed it has still greater resistance."

Wood office furniture, like domestic equipment, may be had in designs which appeal much more to the sense of beauty than when steel is used. The workable qualities of wood enable the development of graceful lines which are in sharp contrast with the severe designs which are found in steel furniture, as a rule. Thus the appearance of furniture made of wood and glued-up stock may be set down as a strong argument in its favor.

In the same connection may be mentioned the "companionability" of wood. This is hardly the word, yet it expresses the idea. The greatest objection most people would have in living in a prison, outside of the moral questions involved, is the contact with steel bars and stone walls. These materials simply do not appeal to human beings. Steel furniture is a step in the direction of the celled prison, and for that reason is repulsive. That this is true is shown by the fact that many users of steel furniture—who it is hoped have repented of their purchases—have found it necessary to supply coverings of battleship linoleum or plate-glass tops in order to enable their employees to work with any degree of comfort about such pieces. And the fact that even the strongest advocates of steel in office equipment have never had the temerity to suggest that chairs be made up in steel is ample proof that the human body prefers contact with warm and relatively resilient wood to cold and resisting steel.

The question of durability and depreciation must also be taken into account in casting up the argument for and against wood, and while it is true that a poorly-made desk or other piece of office furniture is not durable, it is also possible to point out defects in poorly-made steel furniture, especially that in which bolts are used instead of welding. But considering the best of each kind, it may be asserted without successful contradiction that wood is the equal if not the superior of steel in this important respect. A well-made wooden case will never collapse under use, will hold its appearance and will give service for as long as the average user desires to make use of it. No more could possibly be said of steel. It is claimed that steel furniture, on account of its comparative novelty, has a larger resale price than wooden goods, but inasmuch as most buyers are not concerned with second-hand values, this point is hardly worth serious attention.

The objections which are made to wooden furniture because of the possibility of the drawers sticking, etc., are the result of inferior manufacture; and since defective workmanship can hardly be considered an argument against the type itself, it may be ruled out, or at least offset by the fact that users of steel furniture, especially those in large offices, have found that the tremendously increased noise due to the closing of steel drawers, which creates a clatter resembling the operations of a boiler shop on a small scale, is a major objection. This has become so strongly marked, in fact, that it has been found necessary to provide roller slides for the elimination of excessive noise and even this does not take care of the objection altogether.

Another important consideration in connection with furniture in the office is that of handling and repairing. In both of these connections wood is by far superior to its rival. In the first place, no business concern is permanently established in one set of offices. Hardly an establishment can be named which has been at the same stand since its organization. That means, then, that its furniture must be of a kind which can be moved about with a certain degree of ease, for even if the offices remain the same, there is frequently desire for a re-arrangement of the furniture for the sake of convenience or to make room for additional employees.

The excessive weight of steel furniture proves a great obstacle to handling, and makes it necessary to use methods which are entirely uncalled for with wood. The sharp edges of steel cases are another objection to handling them, and make the labor and expense of moving greater than with wood. Wooden furniture, which is light, easy to handle and can be moved about with only minor difficulty, has enough marked advantages on this count alone to enable it to make a good fight for consideration.

In the case of repairs the same thing is true. A cabinet-worker from the store of the office outfitter can repair a broken piece of furniture, if it is made of wood, in a few minutes. Usually the work can be done in the office of the user. When steel furniture needs attention the job is usually a difficult and complicated one, requiring not only a considerable outlay of money, but also loss of time, with all of its inconveniences. In many cases the piece must be sent back to the factory to enable the proper equipment to be put to work on it. If there is more rapid depreciation of wood furniture as compared to steel—a debatable proposition—this feature ought to be considered as more than making up for it.

The unit idea can be carried out with splendid results in wood furniture, and the handling of the units is a matter of comparative ease. Taking down and building up do not require expert attention. It is admitted even by advocates of steel that perfect fitting of the units is largely dependent on care and skill in setting up, and that it is usually the better plan to have this done by some one entirely familiar with the cases, instead of allowing it to be attempted by a novice, who could get just as good results with wood as the expert.

The question of price is usually one worth the attention of the user. Wood has been much cheaper than steel for some time—a point which probably had to do with many people purchasing steel equipment, under the impression that what was costlier must of necessity be better. Now that many factories are turning out steel furniture, however, with keen competition in the relatively limited market for their goods, prices have been hammered down until they are not much, if anything, above wood—that is, in the better grades. While this apparently is a disadvantage for wood, it will really result in the two being considered thoroughly on their merits—a situation which ought to hold no terrors for the man who is engaged in making or selling office equipment made of wood.

From this somewhat cursory survey of the field it will be plain that the veneer and panel interests have little to fear from the producers of steel sheets used in office furniture manufacture, for the public, which is usually right in the long run, will ultimately learn that the supposed advantages of steel are more superficial than real, and that good old reliable wood, especially if it consists of built-up stock which will resist the effects of changes in temperature and climatic conditions, as well as fire, is the best for its purpose.—Veneers.

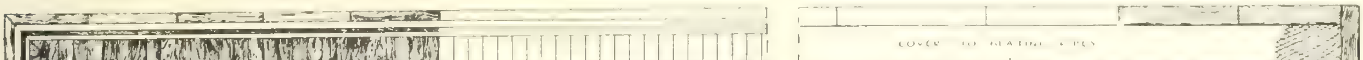
Small Mills are Progressive

THE efficient woodworking machines built to-day hold out wonderful promise to men engaged in the industry. This is especially true of the smaller mills, where it is vitally necessary that production costs be controlled if the business is to survive fluctuating market conditions.

All progressive millmen are not confined to big mills. Some of the most progressive and aggressive men in the industry are doing business on a comparatively small scale.

The small mill employs but few machines, a limited number of men. It is absolutely necessary that each machine as well as each workman perform its full share of the work. If there is a shirker among the men, he must get out. If one of the machines is antiquated and by its inefficiency holds back the production of the rest, it must be thrown aside. Present day conditions demand present day methods.

Each day we hear of modern efficient machines replacing old inefficient ones in small mills. It may be a matcher, a moulder or a resaw. In every instance the efficiency of the new machine has placed the firm on a sounder footing, less likely to be effected by fluctuating market conditions—the nightmare of the small mill inefficiently equipped.



Examples of French parquetry and inlaid floors which illustrate the possibilities of the craft.

Dovetailing Practice

There is a peculiar dovetail sometimes in use amongst experienced woodworkers. Its genuineness is entirely beyond question. It is somewhat difficult to make and is known amongst certain woodworkers as the double bevelled dovetail. Fig. 1 shows the dovetail in perspective, the pins being bevelled two ways, hence its name. The pieces forming the box or drawer having been united, it becomes necessary to secure the connections in the proper place and also to obscure the recesses at the end of the box. This is accomplished by a thin lining put at the ends, as shown in Fig. 1 at "C." This having been done the connections cannot give way and the joint needs no glue to hold it together.

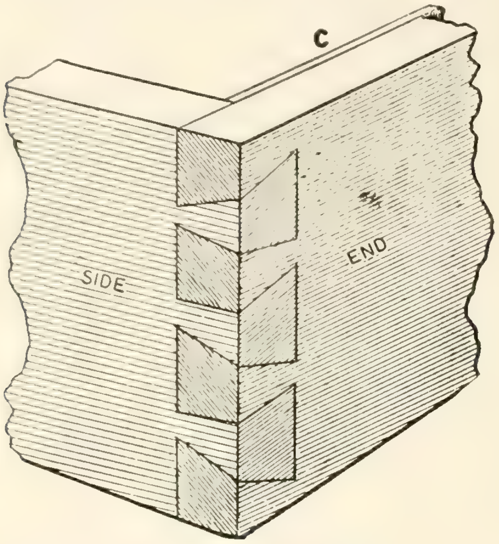


Fig. 1—Dovetail in perspective.

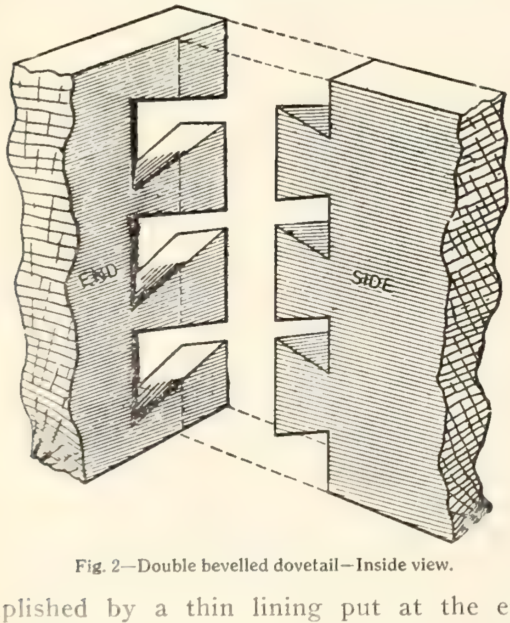


Fig. 2—Double bevelled dovetail—Inside view.

Fig. 2 shows the inside view. This is somewhat puzzling to the amateur, as it is difficult to understand if the process is not known.

A joint remedial enquiry has been instituted by the Federal Departments of Agriculture and Commerce, United States, because of the fact that three thousand billion feet, board measure, of timber now standing in the United States is being reduced at the rate of sixty billion feet annually. The commission will seek to establish the essential facts relating to supply, exploitation and marketing of timber at home and abroad, and to analyze the underlying causes of present unsatisfactory conditions.

The British steamer, Robert Dollar sailed from Victoria, B.C., on June 27 for Atlantic ports, carrying a cargo of 4,845,000 feet of lumber and timbers for the Toronto harbor works. The unloading point will be either New London, Conn., or Montreal. The cargo is unique in that it is the largest ever shipped from a British Columbia port, and the second largest ever to have left the Pacific coast.

Sawyers and Resawing

SOME resaw operations are so common in practice that one quickly notices any deviation from the regular practice and wonders if the way it is being done is correct and the newer way wrong or whether it is just the other way about.

I looked in a mill a few days ago where the resaw was cutting inch stock into three pieces, says a writer in Wood Craft. It looked strange to me to see the board passed through and have one roll set at scant 5/16 and the tail man load the cut onto one truck and the thick piece on another to be taken back later and the outer roll set up and another 5/16 cut taken off, leaving the first board cut off mixed in on the truck with a lot of random widths, while the two pieces of the same board were kept together at the second cut.

This method of cutting was not so convenient for the cutoff man. He could have cut off the three pieces the board made as readily as he could have cut two, all three pieces of the same board grading about alike. In addition to this loss of handling at the cutoff table, the resaw man and the tail man had the handling of the board an extra time, losing time to push back a truckload for the second sawing.

Our way of sawing this sort of rough stock is what we call "thirding" and is done by setting both rolls one-third past the saw line, and having a chute from the tail man to the feeder, in which both pieces of the first cut are placed with the thin pieces of the first cut are placed with the thin piece turned over so that the two outside surfaces of the original inch board are together and it is thus passed back through the rolls, the saw cutting the thick piece into the other two-thirds without letting the board down on the delivery truck until it is sawn in three pieces.

The crosscut man then has all three pieces of the same board and grade, width and length, and gains 33 1/3 per cent. in cutting time. The ripper has the same advantage, as he can rip to grade on three pieces as readily as he can on two, when all three are alike.

To meet this requirement was what brought out the twin band resaw, with the two blades, one a right-hand saw and one a left-hand, cutting an even distance apart, but with the varying thickness of rough lumber, this left a variation in the boards that "thirding" on a single saw does not make, nor is it made on the twin thirding saw where one blade follows the other with guide rolls to hold the second saw to its place one-third of the thickness of the piece being sawed without any regard for the varying thickness.

Either of the two latter machines will almost double the output, but keeping the pieces together is the better method where there is only a single saw to do the cutting.

The Principles of Sanding

SANDING is one of the things that cannot very well receive too much attention in the furniture, piano or organ factory, writes W. H. Homer in The Wood-Worker. In these shops a pretty high finish is demanded, much higher, usually, than in a planing mill or factory devoted exclusively to interior wood work. As the quality of the finish depends in no small measure on the way the wood is cleaned up, the necessity for good sanding is at once apparent.

Almost every man has his own favorite way of doing the work and clings to it, not because it is the better way, but because it is the way in which he has been accustomed to doing it. Some men will swear by the belt sander and some will swear at it. Some men would rather sand everything by hand that cannot be put through the big three-drum sander than to bother with any other machine. Others, again, do not want to do more hand work than is absolutely necessary, and will gladly perform each operation on the machine best adapted for the work—and these are the wise men.

Machine sanding, if done on a machine adapted to the work, is not only superior, but is done many times more quickly than by hand. But there is no one machine that is equally suited for all kinds of work, and in selecting a sander one must not be misled by the statement that a certain make or style is the best on the market, nor by a testimonial to the effect that it is doing perfect work in one factory. If a machine does perfect work in one factory, it ought to do perfect work in another factory manufacturing a similar line of goods. But if the work to be done is entirely different, the results may be equally so.

For large flat surfaces there is nothing that surpasses the three-drum sander. Of course, this machine is not endowed with brains any more than any other, and if the operator does not supply what the machine lacks, the results will not be what they ought to. With a man in charge who understands his business, who keeps his machine clean, properly adjusted and the paper in such shape that it will cut and not polish, and who understands how to distribute the work between the drums—in this machine and such a man we have a combination that leaves little to be desired.

A surface that is polished in the sanding process is not necessarily well sanded; to make a good job a surface should not be polished. Very little wood is finished natural, and it is only where the wood is to be left the natural color that a surface polished in the sanding is of any benefit; and even then it is negligible. On wood that is to be stained, no matter whether an oil or water stain, a polished surface is a positive injury, in that it prevents the stain getting a proper hold on the wood. The result is that the places polished the most have a faded appearance.

Uniform sanding has much to do with a uniform color in stained work. The depth of color depends considerably on the depth to which the stain penetrates the wood. That is why the same stain will color basswood darker than it will color maple. If the fibres of the wood are left so that they absorb the stain, a good deep color results. But if the surface is made so hard and smooth that the stain remains on the surface until the liquid evaporates, the color will be pale and faded looking.

But, coming back again to the machines, what has been said about the three-drum sander may also be said about the belt sander, i.e., it has no brains, and brains are absolutely necessary to its successful operation. The reason so many machines fail to give satisfaction is because the operators do not understand them. Sometimes it is thought that anybody can run a sander—that is mistake No. 1. Then mistake No. 2 is made by supposing that because a man is fairly intelligent and capable of doing some other things fairly well, he ought to be able to make a success of running a sanding machine.

Every man has brain capacity of some kind. In some men the brain is developed uniformly; in others it is developed abnormally in some one direction, and these men can do but one thing and do it well. Occasionally we find among this class a man who has a mania for machinery, and sometimes that mania is narrowed down to one particular kind of machine. The firm I was with some years ago had a man who was a sort of roustabout in the machine room; most people thought he had "rooms to let in the upper storey." But there was one room that was not vacant, as subsequent events proved.

The firm had experienced considerable trouble in getting satisfactory results from the sanding machine. One day the regular sanderman was off, and the roustabout, who had been acting as helper, undertook, without saying anything to any one, to run the machine himself. To the surprise of every one, the results were such that he was allowed to continue, and was still running the machine when last I heard of him. The men who had preceded him had been selected for their average intelligence, but were unable to make good. This, of course, was an exceptional case, but it illustrates the point I desire to make—that of selecting men who are naturally adapted for the work they are to do.

In addition to the three-drum and belt sander, every factory should have an open single-drum and a disk sander. This disk may be attached to the same shaft that holds the single drum and both run on the same frame. A great deal of stock can be sanded on these that one might find difficult to work on any other machine. Then there is the spindle sander, which we would find it difficult to get along without in a shop that has a variety of work to do. Every machine has its place, and no machine should be condemned simply because you either have not got the work which it is best adapted for, or the man who is capable of successfully operating it.

As the outcome of recent tests made by the Australian government, that country claims the strongest wood in existence—yate. According to announcement of tests, the average tensile strength is 24,000 pounds to the square inch, equalling that of cast iron. One specimen was tested up to seventeen and a half tons to the square inch, which is equal to the tensile strength of wrought iron. It is stated that the tree grows to a height of 100 feet and sometimes two and a half feet in diameter.

Taking shell bark hickory as the highest standard of our forest trees, and calling that 100, other trees will compare with it for hardness as follows: Shell bark hickory, 100; pignut hickory, 96; white oak, 84; white ash, 77; scrub oak, 73; white hazel, 72; apple tree, 70; red oak, 69; white beech, 65; black walnut, 65; black birch, 62; yellow oak, 60; hard maple, 59; white elm, 58; red cedar, 56; wild cherry, 55; yellow pine, 54; chestnut, 52; yellow poplar, 51; butternut, 43; white birch, 43; white pine, 30.

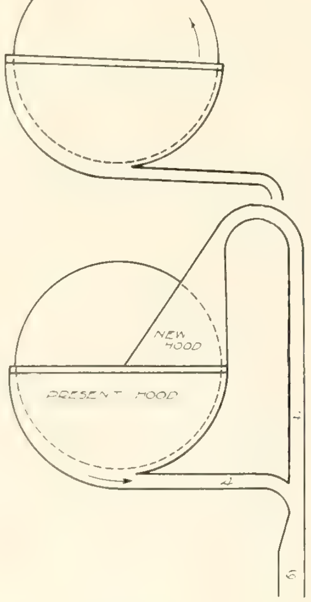
QUESTION BOX

A Practical Department of Reference for the Practical Man

Dust Problem with Blower System

Q.—"Our Sand Wheel, which is a five-foot one, used for finishing the edges and corners of boxes, is connected to the blower system as per the attached sketch (Fig. 1). While there is a good draft in the pipes, the dust is a veritable nuisance, for it persists in following the wheel and making that section of the mill almost uninhabitable. We would be interested to know if any of your readers have had the same trouble and succeeded in remedying it."

A.—The trouble with rig shown in your sketch is that the opening into the pipe is too near the bottom of the wheel. The dust being mostly light and fine follows the wheel for a considerable section of its travel before it is thrown off. Of course, some of the dust—probably all the heavier particles—goes to the pipe, and the easiest and most effective remedy for this collector would be to build another collector covering the right-hand upper quarter of the wheel, and connected into the pipe also, which should be fully six inches diameter at the Y. A four-inch pipe to each opening will probably be sufficient to catch the dust or the most of it. (See Fig. 2, lower sketch).



Figs. 1 and 2.

Piece-Work in Woodworking Factories

Q.—"Can you tell us if piece-work has ever been successfully introduced in woodworking factories? We are not satisfied with our present day work basis of payment, for it seems almost impossible to further reduce the cost of our various operations, many of which must be made cheaper in some way to meet competition. We realize that the widely varying conditions met with in working up lumber make it difficult to establish fair rates, but this is a problem that we believe must be solved, and perhaps some one can save us the time in enabling us to start right."

A.—Undoubtedly the piece work system is the correct form of payment in any line of work, and, if introduced carefully and administered fairly and wisely, it cannot fail to benefit both employers and employees. The establishment of the proper rates, however, is a ticklish job, particularly where no direct cost system is in use based upon time cards, which, however misleading, sometimes give the start required. Time cost systems, as we all know, are very misleading things at best, and probably if you desire to start right the first time, you had better disregard your cost system if you have one, unless you use it in the following way. If you have no reports from your men, or gangs, as the case may be, you will have to start in and get some quietly, in order that you may have a good idea of what the men are doing under the present system. After having arrived at the average time required for a hand to turn out one hundred pieces, which we will say is an hour, and for which you are at present paying 20 cents, call this 100 pieces the standard hour's work and make him an offer of a five per cent. increase in his pay for every ten per cent. increase in production. If the 100 pieces now cost 20 cents, one piece costs .002. Now suppose the workman turns out 150 pieces per hour (and he will do this, you may rest assured), your production has increased fifty per cent. and you must increase the man's rate 25 per cent., which is 25 cents for 150 pieces, or .00166 each, thus an expenditure of 5 cents has made possible a saving on those 150 pieces of .219, which is not bad, either for the man or for you. The natural tendency for the man, after having done himself this good turn, will be to try and better it after a while, and he will find a way to do it, too, so that the more he makes the more you save; you are both working toward the same end, there is not need to cut the price for he is cutting it all the time himself, and friendly relations are established which again mean profit to you. Of course, if he was fooling you too badly when working on day work and under the new system makes more money than you do yourself, you had better fire him and start another man where he left off, in which case, you win again. He is entitled to any increase, within reason, which he makes through his own efforts. But if, on the other hand, you change design, process or machinery which makes possible a reduction in the cost of the operation, you are entitled to reduce the price. If, after a time, it is apparent that no further reduction is being made, you can make the basis at that time, the piece work price flat, for convenience in figuring, etc., but be careful how you change it after that, or you will have your men regarding you with suspicion and limiting their output to anticipate your reductions.

Treated in this way, even the most complex problems in labor adjustment yield slowly and piece-work prices based upon actualities rather than upon a theoretical basis may be evolved, even in the lumber or any other line of business.

Trouble with Fuse Blowing

Q.—"We are operating our factory by electric power, 550 volts, three phase, 60 cycles, and the erratic way in which our fuses fail at times is hard to understand. We have thought that the fuses were too small and have replaced them with larger ones, but without effect. Sometimes this gives us a lot of trouble and then again we are free from it for weeks at a time. Can you suggest the reason and if possible a remedy?"

A.—In a three-phase system, the integrity of each of the several fuses or circuit breakers in the line from the generator to the motor is necessary for the successful operation of all the others, and many times if you have a general outbreak of fuse blowing, it is due to the failure of a fuse or circuit breaker outside the mill altogether, perhaps at the transformer in the street or perhaps at the generating station. The momentary failure of the current in one wire may blow the weakest fuse in the other two circuits. If this happens to be at the motor, the machine will continue to run, but will consume a greatly increased current which will eventually blow another fuse and stop the motor. Now the peculiar part comes in; the next fuse may not be one of those at the motor, but it might for instance be one of the branch fuses at the panel board, which would then throw the whole line out of commission, and if not stopped, work back through the main fuses and start to affect fuses here and there all over the mill. The replacement of the fuse at the motor won't do any good in this case, and meantime, while you are fooling testing fuses, mischief is afoot all over the place. If you have not already made one, you should fix up a little box with a glass top in which two 250-volt lamps are connected in series, with well insulated wires leading out, long enough to permit you to reach any two terminals in the same circuit on the main board. By touching the ends of these wires to any two terminals in the same circuit, the lamps will light, indicating that current is flowing and the circuit up to that point O.K. Sometimes a fuse, particularly the large ones will not blow at once, but will hold a weak current, in which case you will notice a dimming of the lamps. If a fuse is blown in one part of the mill and is followed right away by another, go at once to the main board and test the largest fuses, then each circuit separately, until you locate the difficulty. If you always do this, you will eventually weed the weak fuses out of the system and if your action is prompt you can usually confine the difficulty to one circuit. When running on two fuses, a three-phase motor always changes its hum and heats up rapidly, so a general education of the shop hands on this simple point will result in the prompt stopping of the affected motor before much damage is done. Sometimes, fuses blow out on account of a ground between a wire and the metal conduit or a water pipe or a wet timber, and the ground must be discovered before operations can be resumed. Always test for grounds when working around the wires by holding one wire of your lamp on the ground connection, while you touch all three wires in the conduit with the other end.

The Hardwood Market

In a general survey of the situation in the hardwood market in Canada as we find it to-day, it is questionable whether the unstable conditions produced in many quarters by the war will have anything like a prolonged adverse effect. That business in most hardwoods has been materially reduced in the last few weeks is not open to doubt, but though the outlook is obviously uncertain it is by no means bad. Prominent Ontario dealers are taking courage and looking to the near future for a pronounced revival in trade conditions. The furniture factories apparently have not begun to utilize large quantities, and the immediate effect of this is that present orders are curtailed owing to the limited stocks carried. While some hold to the opinion that the sale of hardwoods will decrease owing to limited export and reduced manufacture of furniture, others are convinced that trade is already brightening up, that the silver lining, which is said to run through every cloud, is about to make its appearance once again, and that though it may take a few months to accomplish the prospects of exceptionally brisk business next spring, or earlier, are certainly regarded as good. Prices are remaining firm and birch appears to be most in demand at the present time. Reviewing the situation across the border the American Lumberman says: "The European war's effects on the hardwood trade have caused many of the export mills to close, which has helped clarify the domestic atmosphere. Manufacturers believe that as the season advances the business tone will improve. The financial situation is expected to be less stringent by that time and there should be a fair demand throughout the fall. The industries are buying lumber a little more freely than in midsummer and are taking a somewhat wider range of stock. The demand, however, is largely for immediate needs. Implement and furniture factories are in the market for material but there is no reaching forward. Box manufacturers are still operating on a fair scale and this calls for low grade gum and cottonwood. Prices are generally steady, although now and again generous concessions to move surplus stocks are heard of. In the northern woods the usual observation is made that maple and good grades of birch are the best movers."

The Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., Sept. 10—The role of the innocent bystander is seldom a pleasant one, for according to precedent he is usually the one who is worst damaged. However, in the present instance—referring to the war in Europe—the North American continent seems destined to profit highly by the elimination from the world's markets of the products of Continental factories, and by the demands which are being made and will continue to be made on the farm products of this Continent by the millions of hungry mouths in Europe, where production has been succeeded by destruction, and selling by slaying.

Some manufacturers seem unwilling to profit by the cataclysm on the other side of the Atlantic Ocean; but there is no reason why the wants of nations which are customarily supplied there may not be filled by Canadian and United States manufacturers. In fact, that is exactly what is being done; and while it will take some little time to get the movement started in volume, and some financial arrangements are necessary, North America undoubtedly will rise to the occasion, and will make and sell the goods which consumers elsewhere are demanding.

It has been pointed out by some shrewd business men that the mere stoppage of foreign imports, and the necessity on the part of Americans above and below the Lakes to use goods of home manufacture, will be a cause for prosperity. In 1912 Canada imported $234,000 000 worth of goods from other countries, excepting the United States, and in 1913 the total importations exceeded $150,000,000. Much of this enormous movement of goods has been interrupted; and Canadian factories must now go to work and produce the merchandise which was formerly imported from abroad.

Hardwood manufacturers in the United States are looking to Canada to consume a big percentage of the production for this very reason. The same opportunities which lie before manufacturers in the United States are presented to those in Canada, and if they do not take advantage of them, the fault may be readily placed. But even if Canada does not make an aggressive movement in the direction of exporting her surplus, the very necessities of the situation will bring her millions of dollars from Great Britain and elsewhere in return for her food supplies. Seventy per cent. of the population of Canada depends on agriculture, and this being the case, the prosperity of the agricultural element, the one fact that is absolutely and finally assured by war-time conditions, means the prosperity of the whole country; for with the farmer's pockets bulging with money, everybody else is bound to share with him, for he is not only the champion producer, but the champion consumer.

The farmer will buy agricultural implements; he will build houses and barns; he will need furniture. The woodworkers of the country will have to supply his wants in large measure, and if they go after his business in the right way, he will respond in a manner that will leave no doubt as to general prosperity being on hand.

A Canadian concern manufacturing office equipment, much of which is made of wood, was recently quoted as saying that its business this year has been greater than in any preceding period, and that the only time during which sales fell off was during the first week of the war. In other words, business men, while necessarily following the fortunes of the allies closely, are not neglecting their daily labors, and will go ahead making and buying and selling; and office equipment, as well as other products of wood, will be in even greater demand than ordinarily.

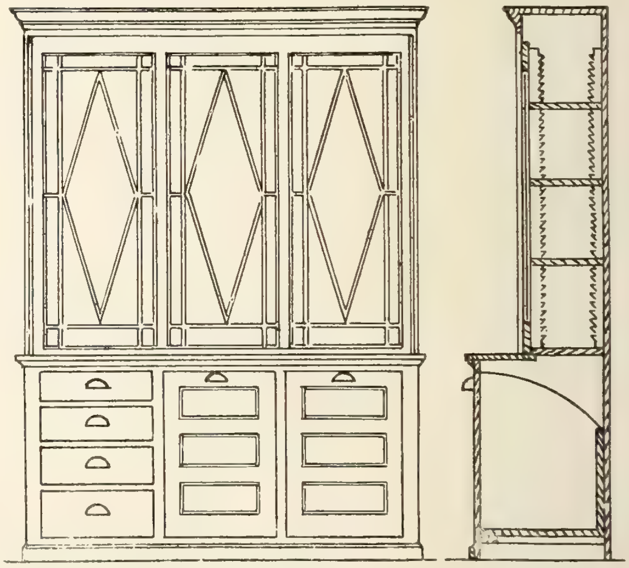
The lumber situation is favorable to the buyer at present, and this is one of the things that ought to be emphasized. Planing-mill men should call attention to the fact that since material may be had for considerably less than heretofore, now is the best time to build. Everybody wants to get in at rock-bottom prices, and undoubtedly building materials, especially lumber, may be had at less cost than for many years. Certainly, with the cost of timber steadily advancing, it is hard to say when such another opportunity to build cheaply will be presented; and the Canadian woodworker, especially the millwork man, will get business by calling proper attention to this feature.

The furniture manufacturers have an interesting situation on hand. The prospect of Circassian walnut being entirely shut off, and the imports of mahogany, which usually moves through the English markets, being considerably reduced, has caused consumers to consider seriously the raw material situation. Mahogany manufacturers in the United States are accepting orders without qualification in most cases, though prices are advancing; but it seems likely that the supply of mahogany may possibly be somewhat curtailed. In view of this possibility, it may be the part of wisdom to consider the use of quartered oak, American black walnut and gum, all of which are being given prominence at present. In fact, the black walnut people say that the revival of the wood has been accomplished, and that the war could not have come at a more opportune moment, in view of the practical certainty of the substitution of this material for Circassian.

Canada and the United States seem to be the most fortunate countries in the business world at present; and while no one rejoices in the misfortunes of his neighbors, there can be no criticism of the plan of taking advantage of whatever conditions have been brought into being.

A Combination Cupboard and Sideboard

The illustration herewith is the front view of a combination kitchen cupboard and sideboard, built in semi-craftsman style. The demand for built-in cupboards, sideboards, buffets, etc., is more and more on the increase. No doubt this year a still greater demand will be shown for this line of built-in woodwork. The dimensions of this combination cupboard and sideboard are as follows: Opening in width, 5 ft., opening in heights, 7 ft., depth, 16 ins. The doors are fluted in plain U-style. The side view shows the arrangement of the flour bin. In the centre a diamond shaped mirror is placed, while on each side green colored art glass is used. Wood finished in the dark oak or early English color is an arrangement which will show up to particularly good advantage.


Combined cupboard and sideboard.

Co-operation with your trade paper will pay as well as almost any form of co-operation. Help the paper to make good and it will help you to make good.

A Round of the Woodworking Industry at the Toronto Exhibition

Passing Mention of a Few of the Many Creditable Displays noted by The Canadian Woodworker

GRATIFYING success attended the 36th Annual Exhibition of the Canadian National Exhibition Association held at Toronto, August 29 to September 12. The woodworking industry was well represented and the displays generally reached a very high standard. Below we refer briefly to a number of the exhibits:

Cowan & Company, Galt, Ont.—Had, as usual, one of the most interesting exhibits in Machinery Hall which attracted the attention of many owners and managers of woodworking companies. Their exhibit included their No. 280 power-feed saw, No. 288 hollow chisel mortiser, 6-in. molder and surface planer with cylinder and jointing attachment.

Batts Limited, Toronto.—Exhibited an especially attractive variety of doors, columns and interior finish in the Industrial Building. One of the interesting features of their display was the handsome new catalogue they distributed. It is profusely illustrated and shows an exceptionally wide range of sash, doors, trim and interior woodwork generally.

The Canada Machinery Corporation, Limited.—Exhibited in the Machinery Hall many of their widely known lines of woodworking machinery including molders, tenoners, chain mortisers, etc. The lumbering and woodworking industries have become familiar with this excellent line of machines, and many visitors took a keen interest in the exhibit.

Henry Disston & Sons, Toronto.—Showed saws of every description for use in connection with the manufacturing and working of lumber. This company's products cover an exceptionally wide range and their excellence is such as to have made them a standard for comparison. Their booth, which was most attractively arranged, drew a great deal of interest.

The Elliot Woodworker, Limited, Toronto.—This firm had an excellent exhibit of their well-known woodworking machinery which included the No. 2 Elliot Woodworker, the Improved bench jointer, the Elliot scroll saw and shaper, and the Elliot floor sander and improved drum sander. The merits of the Elliot machines are favorably known in many woodworking plants all over the country.

Mackintosh Hutchinson, Toronto, Ont.—A booth which was of much interest to woodworkers was that at which the Hutchinson portable combination woodworker was exhibited and demonstrated. The machine was fitted with individual motor drive and proved itself indispensable for all classes of woodworkers. An interesting feature of the exhibit was the buzz planer guard, which if adopted generally would save many needless mishaps around this machine.

The Preston Woodworking & Machinery Company, Preston, Ont.—Had excellent exhibits in the Machinery Hall showing a number of important lines of woodworking machinery to splendid advantage. Woodworkers who know the importance of good machinery in a plant, are continually increasing their interest in this company's products and spreading its good reputation. The machines on exhibit included their heavy four side moulder on base, pony planer, and "Hess Bright" ball bearing shaper.

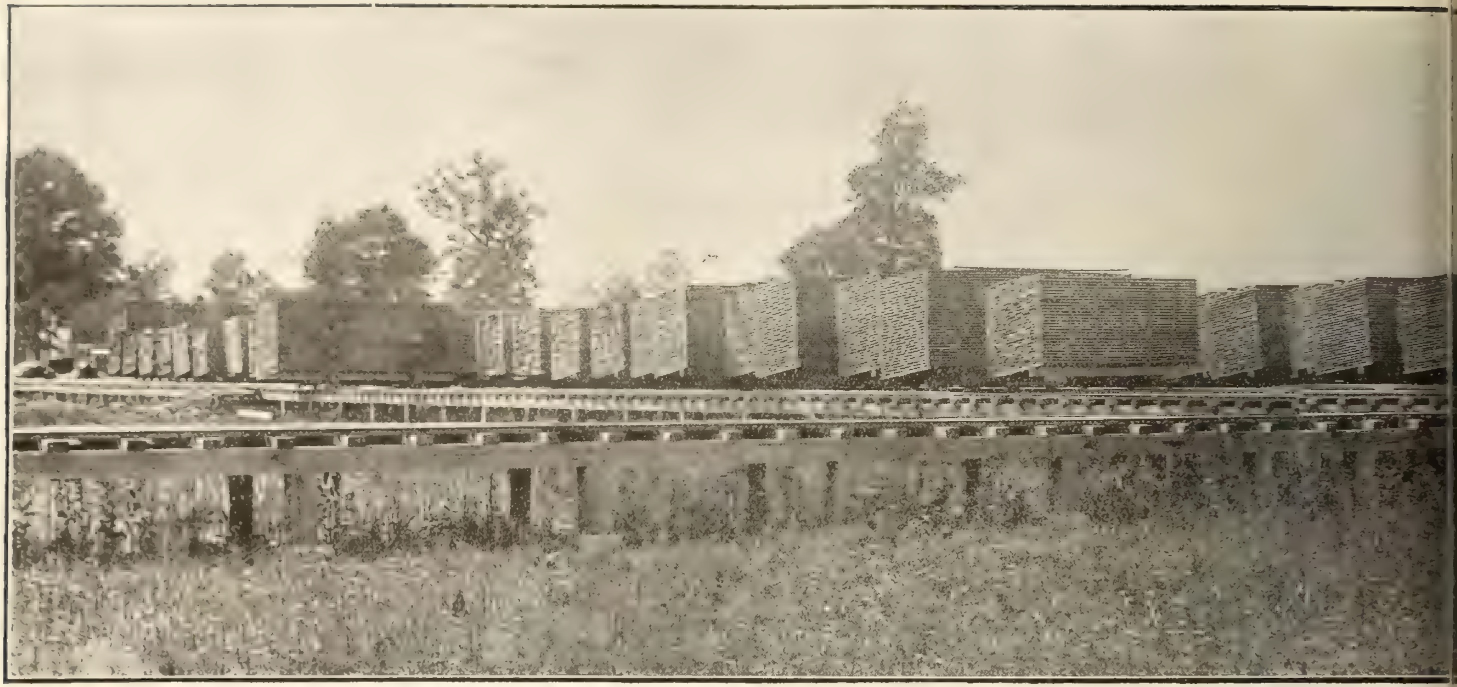
Automatic Fire Detectors, Limited, Toronto.—The importance of detecting fire in its infancy has been realized by this firm, whose exhibit and demonstration came in for much attention. The Automatic Fire Detector consists of a small circular white enamelled wooden base about 4 inches in diameter, on which is a neat nickel frame. Inside the frame is a sensitive metal spring. It is very simple in construction and so sensitive in its application that it should prove of immense service to architects and contractors.

The A. R. Williams Machinery Company, Toronto.—This fiam have exhibited at Toronto uninterruptedly for the past twenty-six years, and some new feature is always placed before the trade in machinery for the woodworker. This year the Eclipse planer, matcher and moulder, carrying four feed rolls 3½ in. in diameter, was shown in running condition. The pony or panel planer manufactured by Major Harper & Son, Whitby, Ont., which represents the latest and most improved type, was also on exhibit and many visitors identified with the woodworking field had much to interest them in this display.

Pratt & Lambert, Inc., Bridgeburg, Ont.—The exhibit of this firm included a demonstration of the qualities of "Vitralite," the white enamel which is claimed to be "long life enamel," manufactured by the company. It is claimed to be particularly adapted to the interior of theatres, libraries, hotels, etc. It has also been used in many of the big ocean liners, notably the Lusitania. A few of Pratt and Lambert's products are "61" floor varnish, "38" preservative varnish, for the finest interior work, "110" cabinet varnish, for general interior work, "Alcolac" the 20th Century shellac, and "Dulkote" which is a varnish having a dull finish.

Berry Bros., Walkerville, Ont.—Had some exceedingly good examples of their well-known interior and exterior finishes on exhibit. These included carriage varnishes, automobile varnishes, house painters' varnishes and stains of various kinds; architectural finishes including the Luxeberry wood finishes, particular attention being drawn to their washable, non-porous, germ-proof, white enamel. In connection with this exhibit an interesting booklet on "Natural woods and how to finish them" was distributed from the booth. For the benefit of enquirers it may be mentioned that the firm maintains a technical correspondence department and also a perfectly equipped finishing room in charge of an expert wood finisher.

W. F. Mahaffy, Plymouth Avenue, Toronto.—The well-known Mahaffy trucks shown by this firm were examined closely by owners and managers of lumber yards, planing mills and woodworking plants. Trucks have become one of the most important factors in labor-saving in connection with factories of every description, and this company's production attracted wide attention. It included warehouse and factory trucks of every description, including a practical truck designed upon a tilting principle, the centre wheels being higher than the end wheels, and the truck being equipped with loose posts. The end wheels of this truck travel on a steel axle furnishing complete facilities for turning corners. This is a principle said to possess many advantages over the swivel wheel. It has been thoroughly tested for many years by European manufacturers. Mr. Mahaffy recently issued a comprehensively illustrated catalogue and any one interested in trucks should send for a copy.



"The Lumber Yard on Wheels." Showing method of storing lumber on trucks

Modern Methods of Scientific Lumb

The Operations of the Kraetzer-Cured
Shows the Relation Between Treatm
and Ultimate Cost—Details of Handlin

TO the average lumber consumer the methods by which his material was produced in the past called forth very little consideration. It never occurred to him how important a bearing the proper treatment of the material, both in his own yard and in the yard of the producer, had on the quality of the goods and on the ultimate cost of his production. In recent years, however, an enormous interest has been aroused in the scientific production of lumber, and the consumer is grasping the truth that the proper treatment begins in the forest and must of necessity be followed through all operations until the finished stage is reached.

The headquarters of the Kraetzer-Cured Lumber Company, at Moorhead, Mississippi, is a fair index of the progress of some of the manufacturers of hardwood lumber who are giving much thought to the problems which confront its users. By the installation of proper equipment, and by giving close attention to the details of producing, handling, treating and drying, they are placing lumber on the market that will more satisfactorily answer the requirements of the manufacturer.

The Kraetzer Process

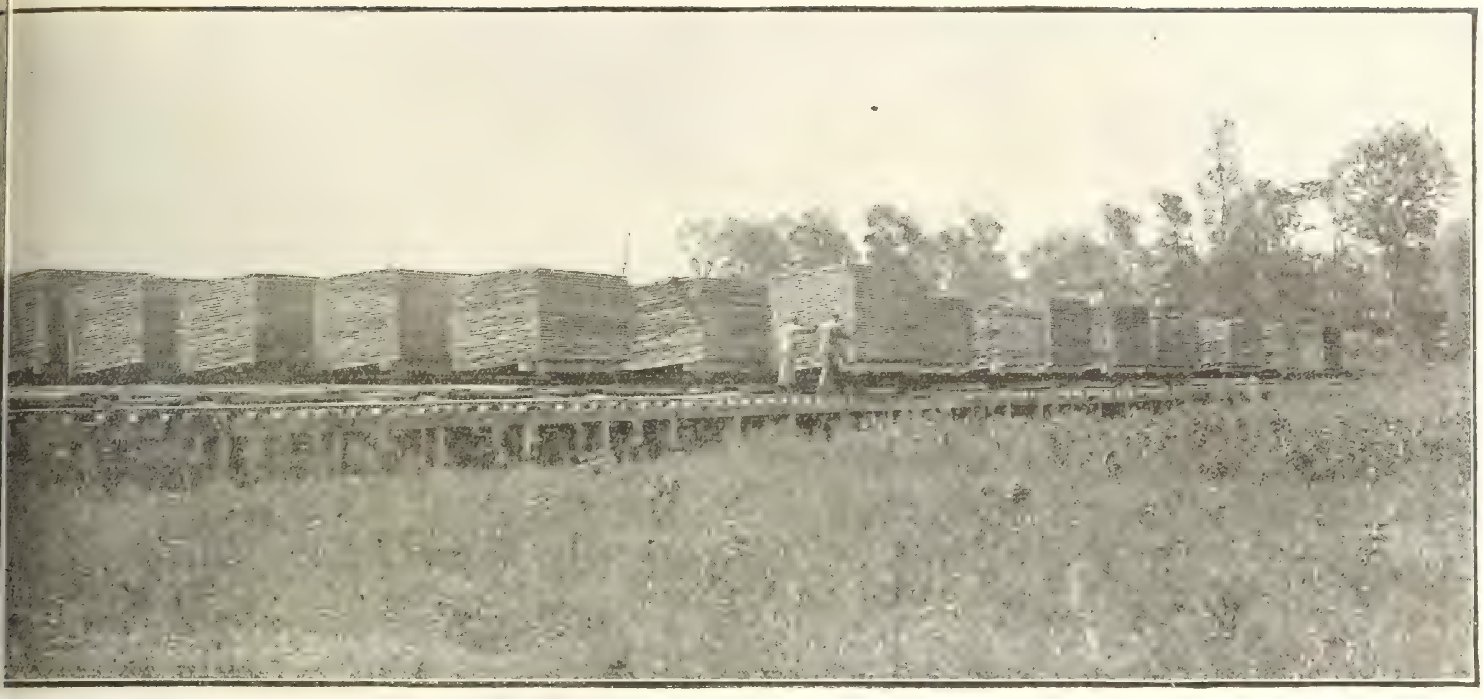
The Kraetzer-Cured Lumber Company takes its name from its adoption of the Kraetzer process for curing lumber with steam under pressure. Great as is the value of this method of treatment, it is only one of the many methods that this concern employs to produce the desired results. Much that they do is original and shows an intelligent study of what is required and the exercise of exceptional care and close attention to detail, that is an interesting departure from the average lumber operation.

The first essential of good lumber is good timber. In this respect the Kraetzer-Cured Lumber Company is bountifully provided. Its lumber is being cut from an old tract of virgin growth timber that has long been held in reserve. One is appalled at the sight of some of the monster trees standing on their holdings, and finds it difficult to refrain from protesting against the destruction of these magnificent giants of the forests. Sentiment, however, must give way to commerce, where the two conflict, and it is well known that from trees such as these comes the highest grade lumber, the soft, even-grained, nicely-textured stock, widths and lengths that are so much desired. The greatest care is exercised to prevent these large trees from splitting or otherwise damaging in felling. After they have been cut into logs, a liquid solution is applied to the ends to prevent checking, stain and depreciation of all kinds, the object being to place in the hands of the consumer the very highest quality of hardwood, free from as many objectionable features as possible.

The company operates its own railroad into its timber holdings, the logging being done by means of steam skidders, the logs being loaded on cars with steam log loaders.

It is desirable to put the logs into lumber as quickly as possible after the tree has been felled, and for this reason the logs, immediately upon arrival, are run directly into the mill, being pulled up an incline constructed for the purpose. Usually not more than two or three days elapse from the time of felling the tree until the lumber is put on sticks. Only a sufficient quantity of logs is carried in the mill yard to keep the mill in operation in the event of trouble or breakdown on the railroad.

When the logs arrive at the mill each log is numbered and carefully examined by the superintendent, with a view to determining for what class of material



, and the side pitch given to piles to permit drainage and promote good circulation.

roduction Through the Various Stages

ompany—An informative Article Which
terial, Quality of Goods Manufactured
, Drying and Other Processes Explained

it is best suited, and the sawyer is given instructions daily for the cutting of each individual log that will go into the mill that day. The mill is equipped with the best and most modern machinery and this is watched closely to see that it is in proper running condition. Where any trouble develops, no matter how slight, that has any bearing on the quality of the lumber, such trouble is immediately corrected. Only the highest class skilled operators are employed under the supervision of a very exacting foreman, and the whole organization is thoroughly imbued with the one object, to put out the best lumber than can be made.

As the lumber comes from the mill, it passes out, by means of conveyor chains, through the sorting shed. Here it is graded and separated according to kinds, thicknesses, grades and lengths, each thickness, kind and grade being put in a pile to itself. Exceptional care is given to the inspection of the lumber at this point, and with a view to eliminating errors as much as possible, two inspectors are employed for this purpose, the one checking the other. A board, as it passes along the chains, is marked by the first inspector according to his judgment. As it passes along and comes to the second inspector, it is examined carefully by him and if he approves of the first inspector's judgment he tallies the board and permits it to pass to the pile where it belongs. If he does not agree with the first inspector the board is thrown out and gone over by both of the inspectors jointly at the end of the day's run and its proper classification is then decided upon. This adds some expense, but ensures great accuracy and uniformity in grades.

Up to this point the operation does not differ materially from several other large modern hardwood operations, but from this point on the lumber is handled in a manner that is quite different and a very great improvement over the usual methods employed.

Many readers, it is presumed, have seen hardwood lumber handled from various mills where it is loaded to wagons or lumber buggies and carried off to the lumber yard, thrown down on the ground and permitted to lie there until the sticking crew could handle it. On account of general familiarity with this usual method a detailed description is hardly necessary for the purpose of comparison.

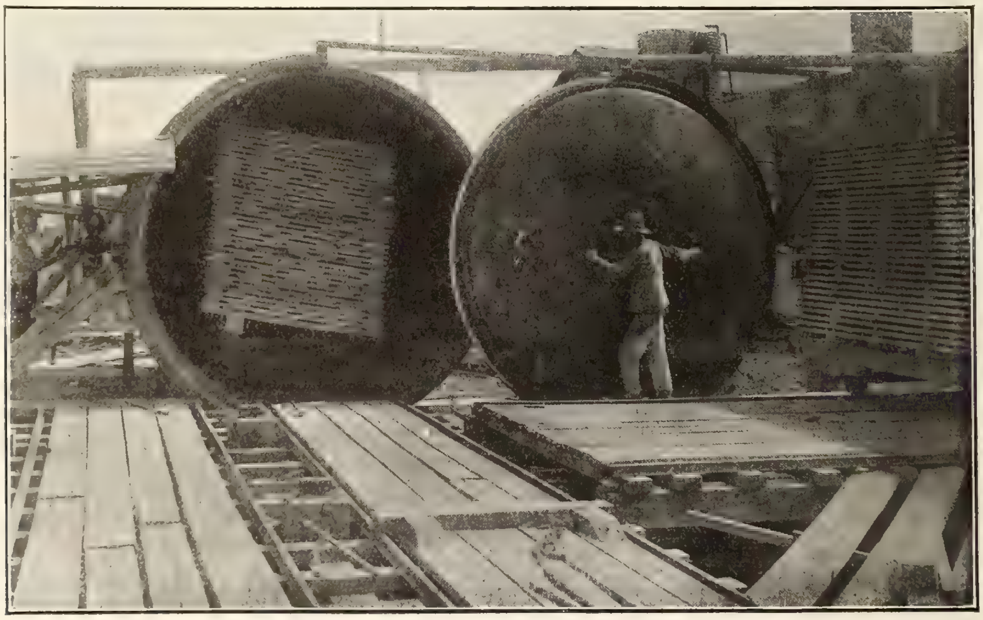
The lumber at the mill of the Kraetzer-Cured Lumber Company is piled directly from the sorting shed to lumber trucks running on steel rail—i.e., it is placed on sticks on these trucks and is not removed from them until the lumber is loaded on cars for shipment. Through the method employed there is absolutely no delay in getting the lumber on sticks. This is of inestimable value in putting out lumber that is bright, straight and in good condition in other ways.

The Kraetzer Preparator

After the lumber has been placed on sticks, the truck is moved to the Kraetzer preparator, into which it is run and subjected to such steam pressure as has been found most advantageous for the different kinds of lumber. It is surprising what limited knowledge some of the users of hardwoods have of this matter. Many imagine that it is a newly discovered method of treating lumber. This is not by any means true; in fact, the principles involved are as old as is the use of lumber itself. The value of steaming lumber has always been known and recognized by those who have studied the subject. There have always been small shops producing high grade goods in limited quantities who have steamed or boiled their lumber. Especially is this true of some of the producers of fine hand carvings and similar work on which the work employed was of great value and would permit the careful preparation of the material used in order that the labors of the artist would not go for naught because of the checking, warping or other depreciation of the wood used. The methods in vogue for the steaming of lumber heretofore have been such as to make this method of treatment impossible for general use, because of the limited quantities that could be so handled and because of the great cost. It is only for this reason that the value of this method of treatment is not more generally understood and appreciated.

The fact that the advantage and value of this treatment has been known to those who have studied the matter is established, not only by the results obtained by the process of steaming or boiling in some of the small plants as described, but by the fact that for years efforts have been made to find some means of subjecting lumber to this treatment on a commercial basis.

About fifty years ago a tank was built and patented somewhat on the lines of the Kraetzer preparator. This tank, however, was much smaller, and was equipped with a door which was locked with a great number of bolts. This was operated quite successfully so far as the beneficial results to the lumber were concerned; so much so, in fact, that for years several institutions paid a royalty for the use of this equipment. On account of the limited capacity of the tank, and the work involved on closing and locking the door, the expense was such that only the very highest priced material could be handled in this manner. The lumber treated by this equipment consisted almost exclusively of the higher grades in mahogany, principally counter tops, and even for this purpose it was found, on account of its limited capacity, to be impracticable. Subsequently another and larger tank was built, several of which are now in use, in which the lumber was put in the tank through a manhole in the top. This necessitated the sticking of the lumber in the tank, which was rather difficult on account of the small space, and after treatment the tank had to cool off sufficiently to permit the men to enter it and pass the lumber out through the manhole. Naturally this method, too, was impracticable for general use.



"The Preparator", in which lumber is steamed or "Kraetzer-Cured".

The new thing about the Kraetzer preparator is the door, which makes a steam-tight joint without the use of any locks or bolts, and which can be instantly opened or closed by a man of ordinary strength. At the same time it permits an entire truckload of lumber, already placed on sticks, to be put into the tank or "preparator." In other words, there is nothing new in Kraetzer-curing, this merely being the name of a practical application of old, accepted and thoroughly tested principles. It is rather difficult to enumerate all of the advantages accruing from this treatment of lumber. It is necessary, of course, for the operator to thoroughly understand the nature of the wood that is being treated, this varying considerably in the different kinds of wood and in the same woods grown in different localities, and for this reason, this treatment can best be administered at the point of production, on account of the operator handling only timber from the same locality, thus giving him a greater knowledge of the peculiarities of the wood that he is treating.

When properly administered on oak, Kraetzer-curing does much to reduce the checking tendency of this wood, the lumber is less inclined to warp, and it makes it more uniform in color, besides giving it texture that works easily and stays where it is put.

The results of this treatment on gum are really wonderful, practically eliminating all of the objectionable features of this wood and making available, at a moderate price, a wood of great beauty, which heretofore was difficult to use, because of its propensity to warp.

It must not be imagined that the steaming of lumber will make up for abuses to which lumber is subjected by reason of improper handling. In fact, the handling and piling of lumber so treated must be given the very closest attention, as only in this way can the best results be attained. Some manufacturers of lumber, prompted by ideas of false economy, after having invested in the necessary equipment to steam lumber under pressure, have sought to limit their cash expenditures on their yard, storage and sticking systems, with the result that they have lost any advantages that might have been gained by the steaming of their product.

"Sorting Chains." Showing double inspection made of lumber to prevent errors.

As every woodworker knows all lumber and wood that is bent is first steamed. After being thoroughly steamed it is bent to the desired position and allowed to dry, and the lumber remains in the position in which it is put. In Kraetzer-curing the lumber is subjected to practically the same treatment, except that it is desired to keep the lumber straight and flat instead of bending it in some unnatural position. It will be seen, therefore, that in order to keep the lumber in this perfect condition it is necessary to so stick it that it will have proper support on the stickers, and will lie perfectly flat and straight in the piles. This is the first essential in the proper handling and seasoning of Kraetzer-cured lumber, and indeed may apply to all lumber.

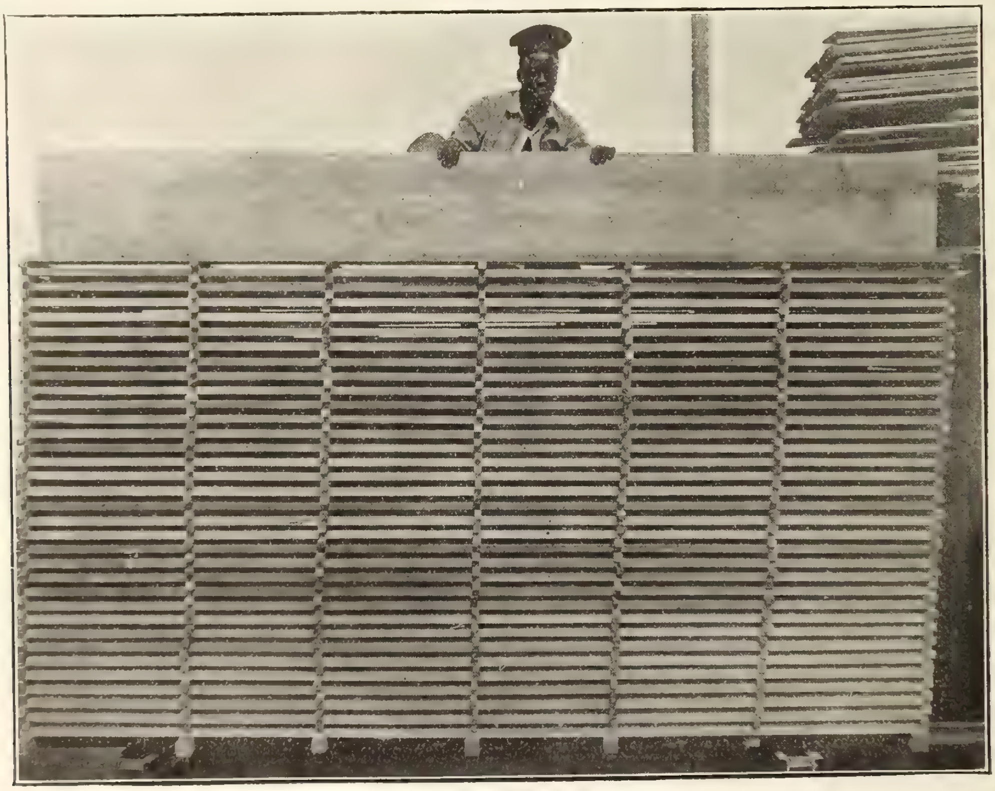
To accomplish this, the Kraetzer-Cured Lumber Company, in order to have a perfect foundation to begin on, piles its lumber on steel "I" beams, these being placed on top of the trucks on which the lumber is stacked and stored. The stickers which are used are uniform in size, and are of minimum size, 1-inch square, to facilitate the passage of the air through the piles. In order to properly support the boards and keep them perfectly straight, seven of these stickers are used on 12 ft. lumber, eight on 14 ft. lumber, and nine on 16 ft. lumber. The next essential is the perfect alignment of these sticks, and this is obtained by sticking the lumber in forms, using only the highest skill-workmen for this purpose, and giving a monthly prize for the best work done. The result obtained is practically perfect sticking of lumber, which in turn results in lumber that is straight and flat and free from warp.

Another matter of great importance in the seasoning of lumber is to provide proper circulation. This cannot be obtained by piling the lumber on the ground, or slightly elevated above the ground as is customary. At the Kraetzer-Cured plant the lumber is piled on the trucks with a side elevation instead of an end elevation—that is, one side of the pile, which is 6 ft. in width, is elevated 12 inches higher than the other side. This offers a decided advantage over the usual method, since an opening higher at one end than at the other creates a draft through such opening. By this method the constant passage of live, moving air is secured, entirely unobstructed, from the low to the high side of the pile. This cannot be obtained in lum-

View of north end of mill. Showing lumber being piled direct from sorting chains to trucks.

ber piled in the ordinary manner, because, while one end of the lumber may be piled higher than the other end, the passage of this air is obstructed by the stickers. The lumber is also piled in such manner that there is a minimum air space between the edges of all boards of 4 inches. This piling, as previously explained, is done at the sorting dock before the lumber is put into the preparator, and remain in this condition until it is loaded on the cars for shipment to the consumer.

After the lumber comes from the preparator it is run out on elevated storage tracks. There are 78 of these tracks, each taking care of a certain grade, thickness and kind of lumber, the aggregate length of these approximating slightly in excess of two miles. These tracks are all constructed on concrete piers and built 4 ft. above the ground, so that with the truck and the steel "I" beam foundations on the truck there is a clear air space below each pile of lumber of approximately 5 ft. The initial investment in this equipment and yard system is considerable, but the results that were observed in the condition of the lumber handled clearly established the wisdom of the expenditures made, for similar results would be impossible of attainment in any other manner.



"The Prize Lumber Stacker." Only sticks of uniform size are used in piling, and these are kept in perfect alignment.

The lumber remains on these storage tracks until ready for shipment, being left on the truck on which originally piled, and not being disturbed or re-handled in any way. Each storage track leads to the railroad loading track, and as the newly treated lumber is put on one end of the track and the loading is done at the other end, it will be observed that the driest lumber is always at the front end, or at the point where the lumber is loaded. In this manner all drayage or hauling of lumber, or re-hauling of same is entirely eliminated. As the lumber is loaded on cars for shipment, another inspection is made, and such lumber as may have escaped observation or may have, through mistake, got into the wrong piles, as well as that which may have deteriorated in drying, is eliminated. The inspection is given very close and careful attention and every possible effort throughout the entire handling is made to eliminate errors.

Any one interested in the use of hardwood lumber, even in the slightest degree, will find a visit to this operation highly instructive and the management assured the writer that any visitor would be cordially received, no matter whether that visitor be a prospective customer or a seeker after knowledge in the scientific production of lumber.

Points to Remember

The visitor starts in the woods of a forest primeval where magnificent trees are being cut in the interest of modern commercialism. They are not being cut in a haphazard manner, but are being selected and felled with care. They are then cut into logs, on the ends of which is applied a liquid solution for the purpose of preventing any deterioration. Almost immediately they are skidded to the private railroad by steam skidders and loaded to the cars by steam log rollers.

Then the visitor proceeds to the mill, where he observes that once the log is on a car it never touches the ground again. He further observes that no man working here does any work that it is possible for machinery to do. The logs are mechanically pulled up an incline into the mill, where they are sawed into boards, but not before examination by an expert, who determines into what class of boards the log should be sawed. The boards pass through the sorting shed on conveyor chains and are given two inspections. Then they are piled on lumber trucks, each grade on a separate truck, and put through the Kraetzer preparator, where they receive the scientific treatment of steaming under pressure. This process insures a product uniform in color, and eliminates the tendency to check, warp and honeycomb.

As the visitor noticed that the log never touched the ground when once it was on a car, he now observes that the lumber itself at no time ever touches the ground. It goes into the preparator on a truck, and as it comes out it is moved on the same truck to the storage track, where it remains until it is loaded to larger cars for freight shipment. This makes for efficiency in the elimination of re-handling one or more times, so common in most yards, and because of this fact does away with breakage or other damage that reduced the grade of the product.

If this operation did not have a thoroughly modern equipment, and yet piled its lumber with the care it does, the yard alone would be worthy of favorable comment. The Kraetzer preparator is not a dry kiln, though in addition to its other qualifications, it does much to hasten the drying of the lumber. It is the kind of pile and the care exercised in sticking that makes this yard worth the study of every furniture manufacturer, or, indeed, any other re-manufacturer of lumber.

First consider the sticker, which in most yards is considered as a necessary evil and given little consideration. This company uses what has been found to be an ideal sticker by several concerns. This is one-inch square. In many a yard can be found tier after tier in which the stickers in one tier range from a half inch to one and one-half inches in thickness, and from three-fourths inch to four inches in width. All stickers should be of even thickness. The one-inch sticker will always lie the inch way, and therefore the course will lie straight. The moisture in the part of the board imprisoned between the stickers must either travel lengthwise of the board or else through the sticker to reach the surface. So it will be seen that the wide sticker impedes drying and thereby starts rot and stain. The narrow sticker calls for more care in placing it, and because the displacement is more apparent, the tendency will be toward more accurate piling.

Next consider the piling in this yard where the lumber is piled with one edge, instead of the end, of the board raised. This makes a sidewise pitched pile that is level lengthwise. The air, which naturally rises, goes up the incline without being obstructed by the cross strips, because they run the same way as the air. Heretofore the general tendency has been to place the boards with the edges close together, depending on the shrinkage to open them up. This is not sufficient. The very time that the lumber most needs the open space to facilitate circulation is when it is fresh piled. So here a space of four inches is left between the edges of each board. Observe further that the foundation of the storage tracks is of concrete, which is cheap, strong and durable, and that there is a clear air space below each pile of lumber of approximately 5 feet.

Finally the visitor sees a third inspection being made as the lumber is loaded for shipment—this and the branding; for, like many manufacturers in other lines, the company is anxious to protect its patrons and all users of hardwoods against deception and misrepresentation, and for this purpose every board as it is loaded is branded "The Kraetzer-Cured Lumber Company." It stands for honest grades and truthful representations, and while it welcomes the patronage of the legitimate and honest dealer, it will not practice the substitution of manipulation of grades, nor will it be a party to any such transactions. In order to make impossible such practice with its product every board of lumber, as it is loaded, is marked, showing the grade for which it is shipped. This, with the brand on the lumber as described, prevents any deception or misrepresentation and protects fully the purchaser of any of its product, either direct or through lumber dealers or wholesalers.

Progress in Fireproofing Wood

By T. C. James

PERSISTENT agitation throughout the country to reduce the fire hazard has, in many instances, led to the replacing of wood work in buildings and other places with metal brick and other material. Incidentally, too, it has led to many efforts to render wood fireproof, or practically so, that it may continue to be used for many of the purposes where it has been replaced by metal. Some of these efforts have developed farcical characteristics, and jokes have been made about the burning of the scrap and shavings of the fireproofed wood in the boiler furnace to make steam.

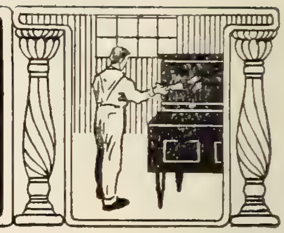
One of the most practical methods that has been adopted in this country is the idea of fire-proofing doors and interior trim by facing them with veneer and putting a cross-banding of asbestos between the veneer and the main core body. This serves the purpose of checking fire, which may destroy the outer veneer face and ruin the wood work generally, but it would not gain much headway, because the asbestos will check it pretty much as a tin covering on a wood door will prevent it burning through. A process for applying veneer in this way has been patented in this country, and the idea is making headway.

There is a new idea, lately reported from England, in which wood is treated with a solution consisting mainly of phosphate of ammonia, which, it is said, serves to fireproof it, and at the same time make it more durable. The process of treatment is similar to the familiar process of creosoting wood to preserve it, as the treatment is given by the use of iron cylinders under vacuum to exhaust the sap, then under pressure to inject the solution. The sap is started by steaming, then the steam and sap are exhausted by vacuum, after which the chemical is turned in and pressure added.

The claims made for this process are that it fireproofs and preserves the wood, yet does not discolor it in any way or interfere with its use in cabinet and mill work. It is claimed that it can be worked, painted, polished and handled just the same as any other wood, and that practically any wood may be treated. In support of the claims made for it is the fact that several railway companies in England are now using it, and that the British Admiralty has adopted this process for treating ship timber and lumber for boats and ships.

The cost of the process is given as ranging from 73 to 85 cents per cubic foot. As that would be equivalent to practically 7 cents per square foot, it is easy to see how the cost would interfere with its use generally for mill and cabinet work, as this cost itself is more than the average cost of lumber used. It would therefore only justify itself for very expensive work, and this will probably prevent it coming into general use, unless some way is discovered of materially reducing the cost of its application.

THE FINISHING ROOM



The "Filling" in the Various Oak Finishes

Specially contributed by Walter K. Schmidt

THAT the filler plays a large part in the production of the color effect, especially in the oaks, is known to every finisher. A filler must be in harmony with the stain, but if it is too radical in shade it becomes freakish, and then when the wood mellows down it shows that it is not a part of the staining operation but that it is applied to the wood in solid form.

How many times I have been asked what kind of a filler to use on fumed oak! I always feel like saying, "Have you looked at the samples that you have seen? Have you inspected the fumed oak as it is on the market?"

Fumed oak stands out as an exception. It is one of the few finishes that does not require a filler. The pores have a brownish color, darker than the general finish, but they are open. In places where a very thin coat of shellac has been applied, and the wax has entered the pores, the wax often dries out, giving it a grayish cast. This cast is noticeable when looking over the work sideways. To overcome this, especially on the cheaper grades of fumed oak, some manufacturers have colored the wax by mixing a little Van Dyke Brown, or dissolving a dark brown, oil soluble aniline in turpentine, and adding it to the wax. This helps considerably, as far as the pores are concerned, but often it adds a shade of brown which is superficial and not altogether reliable, and from which it may have been possible to think a little filler had been used on the stain. Good fumed oak should not be filled. It is preferable to oil the work and when this has well dried to give it a coat of shellac and then the wax. In such finishes as antique oak, Flemish, bog, Malachite green, forest green, cathedral, early English, Antwerp, Belgium, Baronial, Dutch Brown, English Oak, Golden Oak, Tobacco Brown, Silver Oak, Gray Oak, Kaiser Gray, Oriental, 16th Century, Drift Wood, and others, the filler plays no unimportant part in the results.

It would be impossible to club any of these fillers. It might be misleading to the artisan, for it is not only necessary that he know how to produce the stains and understand their application, but also that he be familiar with the general make-up of the filler. As a basis for the production of a good reliable filler, let me say there is nothing better than, nor is there anything equal to, powdered silex. We will not discuss the question as to whether it is better to buy this in paste form or in the dry form and prepare it for use in the factory. This is entirely optional. The fact remains that filler purchased from a reliable manufacturer has the advantage of being thoroughly ground and all the particles thoroughly mixed with the oil vehicle. Then it is an easy matter to stir in the color.

Further, it is always best to use colors ground in oil. Thin them with turpentine and stir it into the liquor filler. It is not the easiest thing to impart the operation to the novice; and therefore I advise those who are familiar with the operation to bear with us while we go into the details of the preparation of a paste filler, making it ready for application in the finishing room. As a basis, take a certain amount of dry silex and stir it to a paste with mixture of boiled oil and turpentine. This paste can be the consistency of a heavy paint. If stirred to this consistency, the dry particles which are left, when the filler is made by hand, are thoroughly mixed with the vehicle; then the color is thinned, usually using nothing but turpentine. When this is so you can pour it out of the can, stir it into the paste filler until it becomes a homogeneous mass, and then it is ready for thinning with naphtha. Filler should be stirred continually when being applied. It should be rubbed crosswise of the pores. When filler in drying settles in the pores, it is an indication that it has been thinned too much. If the filler lifts when wiping off, it is an indication that not sufficient binder is in the mixture. In that case, the addition of a half pint of Japan to the gallon of filler will overcome the difficulty. In the preparation of filler for such finishes as Antwerp, Bog Oak, Flemish, Belgium and Early English, a black filler only is employed. This requires nothing more than drop black, ground in oil. Drop black is much superior to lamp black, and it is only necessary to use a quantity necessary to give the silex a black color.

In such finishes as Baronial, Cathedral, Dutch Brown and Sixteenth Century, the fillers are usually colored with Van Dyke Brown. The same effects, however, can be produced by using burnt umber and toning it down with black, or black and an orange; but the most economical that we have is a Van Dyke. Golden oak was treated in a previous article published in this department of the Canadian Woodworker. In the preparation of greens, there is nothing better than the use of chrome green for coloring the filler. Gray oak should have no filler. Silver oak should have a white filler. Silver oak is becoming more fashionable, especially in the finishing of store fixtures. It probably enjoys a greater variety of shades than almost any other finish, this being due to the fact that the fixture people have not adopted a standard. They are not forced to match previous jobs or the shades of other colors, as the furniture manufacturer is compelled to do especially where only part of a line is manufactured, such as a factory that turns out nothing but sideboards. These have to be of standard shades, so that they will match up with the products of chair manufacturers. Silver oak will become more popular as oak becomes scarcer. It must be understood that the name silver oak does not correctly indicate the style of finish. It is a trade name given to oak that has been stained a very deep, olive brown, verging on a black and then filled with a white filler made of carbonate of zinc—a dull finish, usually wax. It might be well for me to say here that quartered sawed ash works in very nicely as silver oak. The figure does not play an important part in the finish.

It is practically covered over with the stain, the relief work being done by the filler. A white filler, however, must be applied thoroughly. In preparing this filler, nothing but turpentine should be used. Turpentine will give it sufficient adhering qualities, and when wiped off will leave a sufficient amount of white in the pores to produce a silver effect. Some manufacturers coat silver oak with wax, and some sprinkle on the carbonate of zinc after the wax coat is applied. This is usually done by putting the carbonate in a sprinkler top can and dusting it on to the wet wax. Then with tampons of rags the wax is rubbed dry crosswise of the pores until a polish is produced. Silver oak is rarely shellaced, and often delivered with only a filler coat, rubbed to a polish with burlap. In these cases the stain coat is oiled in order to give a mellowness and a somewhat glossy appearance to the wood. The stain coat should be applied very thoroughly so that it enters well into the pores of the wood, as the finish itself affords little protection to the edges where it is exposed to the wear.

Among the exceptions in the styles of finish that are not filled, besides fumed oak, we have Oriental oak, weathered oak and gray maple. It will be seen that the majority of fillers on the oaks are made with black or brown, the only difference being that the strength of color varies. In the greens, chrome green is employed, and in the case of forest green, equal parts of chrome green and drop black, and in some cases a small percentage of brown. In the olive oak, which is another finish used more by chair manufacturers and fixture concerns, the green is only produced by the stain, but the filler is black.

In general the use of silex, colored to match the

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

WOOD STAINS

Ready to Dissolve—Shade Always Correct

Write for Our New Price List—It's Free for the asking

The Book of "GASCO" Stain Products

Compiled by* Mr. Walter K. Schmidt, *our Chemist

and get into direct communication with the originator of these *"Ready to Dissolve" Dry Powder Stains.*

Get our samples of the later creations,—standard shades of Fumed Oak, Grey Oak, Grey Maple, "Brown Mahogany," Sheraton Mahogany, Jacobean oak, etc., etc.

Full direction for procedure with every order—permanent results.

Canadian prices made in consideration of Tariff.

Special—Our Oil Soluble Fumed Oak for quick work.

We will send you working sample.

Get our prices on Blacks, Reds, Yellows, Browns, Oranges, etc., etc. If you have a color to match—we do it.

German - American Stain Company

16 Monroe Avenue (*New Number*) Grand Rapids, Mich.

Our Goods are stocked by: THE WINNIPEG PAINT & GLASS COMPANY, Winnipeg, Man.

style of finish, and thinned with naphtha, is a general procedure. Where large quantities of filler are made and used, a saving can be made by the employment of mineral turpentine, which costs about one-third as much as regular turpentine. Where this is employed, it is well to use about four ounces of cheap rosin varnish so as to keep up the binding qualities that would be had where boiled oil and regular turpentine were employed. Heretofore, people have employed starch, whiting, and various forms of calcium or lime in the preparation of fillers, but these are not used in the present day because of their uncertainty in regard to shrinkage. Nothing is more annoying than to have a filler settle, sinking in the pores as it were. This is due to a gradual coagulation of the filler particles when made out of the aforesaid substances. Silex, on the other hand, may be likened to powdered glass spread over the surface and into the pores by means of the liquid vehicle which has just sufficient adhesiveness to hold the filler in place. There can be no shrinkage in the material and when the work is cleaned up, the excess moisture removed and the filler thoroughly dried, it holds its place and form, and the subsequent finish remains where it is put.

The Middle Course In Staining

Contributed by Leonard Blake

STAINING is practically the first operation in the finishing room, and though not apparently so particular as some of the others in the manner of its carrying out, yet it is one that leaves its effect on all of the subsequent operations. This effect is the more noticeable if it is a bad one.

It is not an operation calling for long and serious care, or taking a lot of time and watching for the best results; rather it is one that requires quick judgment and rapid handling as well as considerable confidence.

The wood to be finished varies in texture—some parts have open pores, some, small pores—and all these variations have their different effects on the stain. The obect of the workman is to counteract these differences at the time of staining by judicious application, so that when the stain dries, the color of the wood will be uniform.

This is where the average onlooker would be misled. He might go into a finishing room and see men varnishing and rubbing and staining, and would be prepared to say that almost any person could do the staining, but it must take good men to do this varnishing and rubbing. Such is the deceptiveness of outward appearances.

The preparation of stain is also important. Under this heading we are confronted by two alternatives. Is it better to make the stain dark and apply it lightly, or would it be easier to get good results by making the stain lighter and by applying it more liberally? From the point of view of the stainer the latter is the more favorable—for two reasons: in the first place, a dark stain must be laid on absolutely evenly to get a uniform color after drying; also, in point of penetration, the light stain is the better, since the coloring matter which was carried by the liquid to form the stain can be carried much deeper into the pores of the wood when the liquid forms a high proportion of the stain. With dark stains the particles of coloring matter clog the pores before much has had a chance to sink in. This is part of the cause of unevenness in drying unless great care is taken when applying to get a very light quantity on the wood. The hard part of the grain gets stopped more quickly than other parts and when the liquid part of the stain has evaporated the stain remains on the surface instead of in the pores of hardwood.

With a light stain liberally applied, however, the liquid is able to carry practically all the color part of the stain into the wood and the results by this means are better and much more easily obtained. The only useful part of the stain is that which gets below the surface of the wood.

There is a great deal of difference of opinion on the question of wiping stain, and here is where the necessity of confidence on the part of the stainer comes in. When a piece of stained work begins to dry and some parts show wet while others have dried out, one is apt to think that more stain has been applied to the parts that remain wet than the others, and that consequently the supposed surplus, if left, will look darker than the balance when dry. It is usually the case, however, that if the stainer is by any means capable of laying an even coat, the wet places represent hard parts of the wood, where the pores are smaller, and in consequence do not absorb moisture so rapidly. Therefore, to wipe these places would be to remove some of the stain before drying, and the result would be a light spot wherever the stain had not dried before wiping.

The stainer, therefore, must have confidence in his work and be able to know whether the wet parts are the result of uneven brush work or the uneven texture of the wood. A little preliminary observation of the work to be stained will help much to indicate what may be expected in the drying.

Where a really dark stain is to be used so that wiping becomes a necessity, the darkening should go the whole distance and not half way. The reason is that when it has to be wiped the stain must be wiped as soon as applied, in order to secure a uniform finish. Unless the stain is very dark it will not darken the wood sufficiently in the short time. To sum up the whole question of wiping, it is always best to put on the stain freely and smoothly, and to allow it to dry naturally. This brings us back to the fact that the stain should be made light and neither scanted nor squandered in application.

A report issued from the Forest Branch of the provincial government states that there are now 800 logging camps, 400 sawmills and shingle mills, and 4 pulp and paper mills in British Columbia, in which are invested $1,000,000,000. The possible annual output is 3,000,000,000 feet. The labor directly employed when running full capacity is 140,000. The value of the product is estimated at $45,000,000. The product manufactured in the order of their importance are—lumber, shingles, paper and pulp, rough materials such as poles, tiles, posts, mining props and smaller manufactures such as sash, doors, boxes and cooperage.

Oil Soluble Stain Powders

Try our latest and best production.
A perfectly Oil Soluble
Mahogany Stain

For Reddish Stain, order No. C 9722; Brownish 8701; to darken add Black No. 5111. With these three colors any style of Mahogany can be produced. Just the colors for making your own Oil Stains.

Send us a trial order and you will be surprised with the results.

Schmidt Co.
Walter K.
306-308 MONROE AVE.
GRAND RAPIDS, MICH.
PUT OUR NEW STREET ADDRESS ON ALL MAIL INTENDED FOR US

The Quality Stain House of America

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

THE GLUE BOOK

WHAT IT CONTAINS

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
Nicholls Building, Toronto

A Better, Finer Finish at a Lower Cost

With the

Aeron Paints With Air **System** Guaranteed

which applies first coaters, enamels and varnishes—thereby removing the inefficient, unsatisfactory hand brush from the finishing room, a smooth and uniform surface is always obtained. There are no brush marks, no thin spots, no sags, no runs and no fatty edges. Every article of furniture comes from your factory perfect in finish—a finish that cannot possibly be produced in any other way than with the AERON SYSTEM.

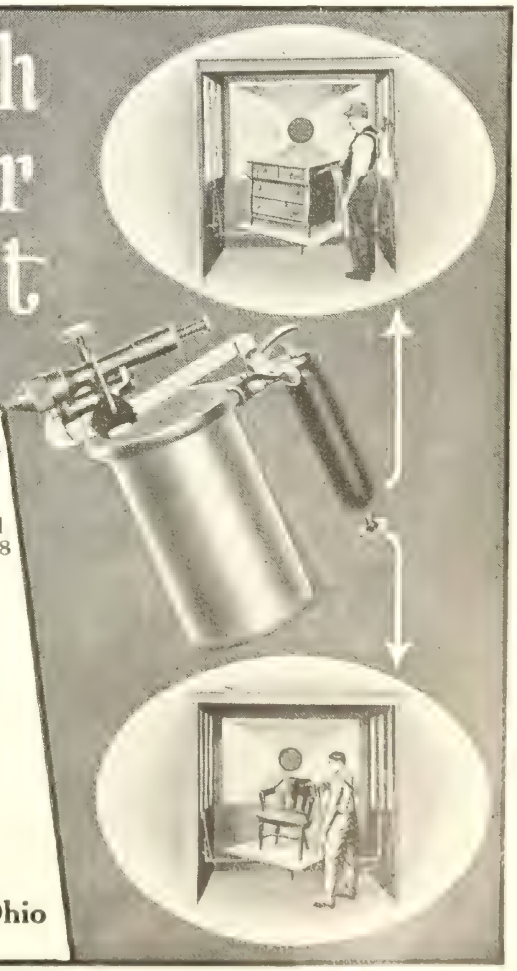
Along with this marked improvement in finish, there is a surprisingly big saving in time and labor. In AERONING, there is no lost motion, one man accomplishing as much as 2 to 8 with a brush—doing better work—effecting a saving of 25 to 90 per cent.

SIMPLE IN OPERATION The AERON will instantly and accurately respond to the operator's every inclination—will meet every requirement. No matter how irregular or rough the surface may be, or how difficult of access the places are, the AERON finishes smoothly and readily. The complete equipment and service is installed on a guaranteed basis.

PROVED RESULTS The AERON SYSTEM is used in hundreds of furniture finishing rooms, and is faithfully and successfully performing its every function. These manufacturers receive daily proof, in the form of savings and better work, of the merit, the economy, the efficiency of the AERON—our claims are based on these actual and regular performances of the machine.

A Post Card request from you will bring
AERON Catalog and AERON Detailed Information BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr Street, Toledo, Ohio



Veneers and Panels

The Canadian Demand for Built-Up Plywood

THERE is an ever-growing demand in Canada for built-up plywood, not merely along the beaten path of furniture manufacturing, but for a hundred and one purposes quite unthought of until recent uses demonstrated its application and effectiveness. Also the additional advantage of obtaining supplies from a well assorted stock in Toronto has been quite a boom to manufacturers, who have not failed to take full advantage of the enterprising foresight which has made it possible to avoid long delay of weeks and months and obtain immediate supplies of sheets in sizes selected with keen judgment and experience, calculated to eliminate all waste by stocking boards in special dimensions. These dimensions have been proven especially economical for all panel and furniture uses, boards being large and cutting to the best possible advantage.

Another feature worth noting is that manufacturers requiring three-ply bottoms for drawers, dresser backs, mirror backs, etc., have found it necessary to buy a suitable cheap wood in car lots and resaw, trim and glue up to their own specifications, which not only means considerable extra labor, but the same labor required to glue up cheap work such as this could for the same expenditure be used on high-class work that would command a greater price at more profit to the manufacturer. Again, only a limited number of manufacturers have veneer plants able to take care of this class of work, and some have not the facilities for veneering at all, hence this latter manufacturer must be alive to the advantages of immediate stock if he would serve his own interests best. The Toronto stock already mentioned is particularly adapted to the requirements of those wishing for a cheap, strong plywood.

It is similar to our native poplar and is rotary cut and shipped into this country in very large sheets without joints, so that it is possible to cut the sheet either way of the grain. This wood is sold at so low a price per M. feet that furniture manufacturers have taken it up largely, saving their labor for better work, and greater profit. Builders and contractors find this wood suitable for their work, and to give an instance, the contractors of one of the largest buildings in Toronto are using it for partition work where the surface is covered with canvas and tinted.

The waterproof cement with which all this wood is put together is invaluable where canvas is applied with wet glue. The cement is produced by a patent process which makes it indissoluble in water, and with a resisting power that defies even hot water and steam pipe tests, being absolutely impervious to action from this source.

Carriage and automobile makers use the better woods for interior panels, dash boards, backs, etc., and find them suitable to their purpose. We were informed that aeroplane manufacturers are using this light wood owing to its weatherproof qualities.

Other uses to which it can be put are almost legion.

For the making of boxes, trays, postal despatch crates, backs for mirrors, picture backs, and to use as cores to build up on when requiring superior panelling it is invaluable.

Owing to the war conditions in Europe and the consequent difficulties attendant upon shipping goods out of the war zone, much difficulty is anticipated as to future supplies coming through to keep stock at normal.

The Importance of Re-drying

WHILE proper emphasis is being laid upon the necessity of the veneer manufacturer drying his product properly before it leaves his mill, the fact must not be forgotten that redrying is equally important. The user of the veneers must not assume that because the veneer producer was supposed to dry the stock thoroughly before he shipped it, it may be used without re-drying and with assurances of satisfaction.

Some veneer buyers evidently think that one drying ought to be sufficient, however, for a veneer manufacturer who recently received an order for a carload of stock was told by the customer that he wanted to have the material so well dried that it could be used by him as soon as received without further trouble on this score. The veneer man replied that this would be impossible, and that he would not agree to deliver material in that condition, pointing out that while it would leave his mill well dried, it would be likely to absorb moisture in transit and would require treatment before being used. The consumer saw the logic of the argument, and did not insist further on this point.

The fact is that no matter how well the stock is dried by the manufacturer, it will not reach the consumer in that condition. The dryer it is, one might almost say, the more likely will it be to take up moisture, under most atmospheric conditions. Consequently it is expecting a physical impossibility to assume that good drying at the mill insures dry stock at the factory.

A certain concern which makes its own veneers for its panel manufacturing operations practices what it preaches, and after drying the veneers in the usual way, it takes them, if they are not used at once, and gives them a warming in a special room used for drying panels. This room has a circulation of warm air and provides the finishing process for the veneers, which leave there ready to go into the glued-up work without any danger of their shrinking after being put to use.

Other panel factories which buy their veneers lay proper emphasis on this part of the program. Elaborate mechanical drying systems are found in a good many panel factories, the veneer user thus going to more trouble and pains, in some cases, in the redrying of the stock than the manufacturer took in the first place. That this provision is well worth while, however, is indicated by the absence of troubles due to faulty drying.

This is a case where it is better to be safe than sorry, as the fire insurance agents say. A panel man or a furniture manufacturer using veneers might conceivably get along with slight provision for redrying, provided he saw to it that the veneer mill was drying the veneers well; but this would be introducing an element of risk that would prove dangerous, and in many cases disastrous. There is no use in doing this, and the sensible procedure is to give the veneers every facility for drying, and thus make assurance doubly sure. That means fewer troubles and less worry on the drying proposition, and when it is realized that probably fifty per cent. of the poor results obtained from gluing up comes from improperly dried stock, the importance of redrying, as well as original drying, may be readily appreciated.

Where the veneer user has a mechanical drying system, the redrying work can be done so speedily and with so little expense in handling that the cost of the work is small. Of course, if no such provisions are available, and much space and time are needed to dry the veneers properly, the expense will be greater. This seems to be a good argument in favor of the use of mechanical dryers by large veneer consumers, and is certainly a legitimate consideration.—Veneers.

An Outline of the Manufacture of Glue

By J. E. Castino

IN the manufacture of glue a well-defined knowledge of the product to be handled is very essential. It is not difficult to understand the fundamental principal under which this article is manufactured, and its making can therefore be carried on to a large extent by the application of good common sense, but to understand and know the details, which are so important in the manufacture of glue, is where true knowledge is required. It is therefore necessary to know the product and appreciate the conditions under which the product available will produce the best results, as well as to know how to master the wrongs which appear in this line, even under the best of management. There are no positive set ways of making glue, although there are rules to follow, and even then each and every batch of glue will be different in some respects.

As glue is finding its way into almost every line of business, the demand for this article is gradually increasing. Each business demands a certain grade, color or quality, and to meet these demands satisfactorily is a problem of no easy solution. Take, for instance, the veneering trade, which requires, generally speaking, a non-foaming, odorless, strong and slow-setting glue; the fancy paper box people do not look so much for strength as for color and odor, and prefer a fast-setting glue; the calcimining trade looks for color and odor in particular, but pays little or no attention to foam, while the printer requires a special grade of padding glue. Novelty manufacturers, bookbinders, furniture manufacturers, etc., require different grades.

As a whole, cheap glues are more in demand today than ever before, largely due to the new channels into which this article has found its way, the steady increase in the prices of raw stock for hide glues, together with the fact that good bone glues are replacing hide glues in many cases and answering the purpose satisfactorily.

There are different methods employed by the glue manufacturers in the making of bone and hide glues. There are many ways, but they all involve the same principle. Some bone glues are made from beef heads, ribs, shoulder bones, etc., crushed and subjected to a low dry steam pressure in tanks for a short period of time, and after pressure is released, hot water is introduced into the tank, allowed to remain for an hour or two, then drawn off and either held for the following runs or evaporated immediately. This operation is repeated five or six times and takes every available amount of glue from the bones. What is left is termed "steam bone," and, when dried, is used for fertilizer purposes.

In some cases the miscellaneous prairie and butcher bones are crushed and first put through the degreasing process. When full of bones, the tank is filled up with hot gasoline and allowed to soak for a short time. This draws the grease from the bones. The resultant mixture of gasoline and grease is pumped out of the tank and the gasoline is separated from the grease by the condensation of the volatile vapors in the mixture. This is termed a "wash." The wash is repeated until all traces of grease in the bone have disappeared. Following this, the bones are put into regular pressure tanks and the liquors drawn off in the same manner as before stated. Bones treated in this manner will produce a very pretty glue, as the objectionable feature of emulsified liquors, which is so common in fresh bones, is eliminated, since grease has a tendency to make the glue opaque. The treatment with gasoline is also a basis for the manufacture of ossein, from which much high-grade gelatine is manufactured.

Another method is the open tank process, which requires the cooking of the bones in open tanks or vats ranging from seven to fifteen hours. This method does not extract all the glue matter from the bones, but leaves a hard bone. In some cases these hard bones are crushed and treated in pressure tanks in the same manner as previously shown. The pressure tank extraction is the cheapest. This method is more difficult to handle than open tanks, but when properly managed by experienced hands is an art in itself, although it produces a slightly weaker glue, owing to the high degree of heat required to extract all the glue matter from the bones, besides causing a slight emulsification of the liquors, especially from the fresh bones.

The hide glues, being a high-grade product, are handled differently. The hide and calf-skin trimmings, sinews, etc., are put into lime vats and treated with a milk lime solution for periods ranging from twenty to fifty days. During this time the stock swells up and assumes a consistency similar to that of rubber. Regular shifts are given the stock to insure a uniform cure. The stock is limed for two good reasons: First, to loosen the hair from the hide; secondly, to prepare same for a maximum yield of glue. A treatment with sulphurous acid, after having been limed, neutralizes the alkalines introduced in the liming. After the stock is thoroughly cured, washed and neutralized, it is ready for the cooking. This operation is very important throughout the handling of glue, both in its manufacture and in its application for use, since heat destroys the gelatinous matter, and renders it, when overdone, a spoiled product, which is necessarily a financial loss. No doubt these facts are common knowledge among glue users, but too much attention cannot be paid them.

It can therefore be seen that the handling of glue entails careful attention. Take, for instance, a foamy glue which is not necessarily the result of improper handling, but in many cases is and can be the direct result of soured stock, liquor or jelly, improper temperatures, prolonged heating or overlimed or poorly washed raw stock. A foamy glue is an inferior one for many uses and is also a dirty or ill-smelling glue. There is nothing quite so objectionable in glue as odor, nothing that people notice quicker when using and nothing that will kill the sale of it quicker than an offensive odor.

Odor, as a rule, can be overcome, and when glue has a repulsive odor it is almost a sure sign that something has gone wrong in its manufacture, although it must be remembered that all glues smell more or less, which is nothing more than natural, because the natural bone swell is there, and when judging glues for odor this fact must be remembered.

Testing—There are no standard recognized methods for testing glue, as every manufacturer has his own method, which he considers the best, and markets the product on a basis of his own tests. The shot and viscosity tests are used quite extensively, however, and are big factors in determining the value of glues.

To the User—See that the glue is thoroughly dissolved before applying heat. Use only cold water for dissolving and water as clean as it is possible to procure. Glue will absorb cold water more readily. If hot water is used, the glue will become ropey and will take longer to dissolve, with a consequent loss in strength. Avoid a prolonged heating, and by all means avoid overheating; 150 deg. F. should be the limit. Some glue users pay little or no attention to the heating. They let the glue dissolve, heat it up and apply it when ready, totally disregarding the temperature, and rather than go to the trouble of making a new batch every day, they allow what glue is left each day to remain in boiling water over night, believing that it will save time the next morning in preparing a new batch. This is very wrong.

Study your needs for the day and prepare the glue accordingly. Always clean out the pots—boil them preferably—at regular intervals, to remove all traces of dirt, burnt glue, etc., as these materially influence the adhesiveness of the joints. Glue that has been heated up to a very high degree undergoes a chemical change, and it assumes the form of what is known as "stick." Some glue manufacturers term it "glue sugar."

Glue-making is an art, a study and a science in itself. When interested there is nothing quite so absorbing as the study of it, for each and every operation in its manufacture requires close attention. The first word of every manufacturer should be "quality," which means good glue, as it establishes a reputation. There is really nothing so pleasing to the eye to behold as a glue that is glue in every sense of the word. —Veneers.

The Construction of Veneered Doors

THE construction of the hardwood veneered door which is such an important feature of the interior finish of the comfortable residence of the present day is a most interesting process whether it be viewed from the standpoint of the layman or of that of the trained woodworker. It is considerably less than half a century ago that the comparatively few built-up veneered doors which were made had to be glued up by hand, as in fact they are in many of the small mills at the present time; but sufficient pressure could not be applied in this way to bring the parts sufficiently close together, and, moreover, it was a slow process, the glue having an excellent chance to set before the surfaces were brought into proper impact.

To-day there are machines for doing all the gluing, not only for the fastening together of the parts that make up the soft wood cores, but also for gluing the face veneer on to it, while heavy hydraulic pressure is brought to bear until the glue is thoroughly set.

In the building up of a hardwood veneered door there is first of all the white pine core; then all the narrow strips of timber are accurately grooved and dovetailed and glued solidly together, in which process the hardwood edge pieces are inserted. Next the soft wood core is dressed and smoothed on all sides to the exact widths required and finally the hardwood veneer having been carefully cut and selected is glued in place. This is in a way a rather complicated process, but it is not so complicated as the machines already referred to, which almost automatically carry the process through to completion. It is in fact these improved machines that make the modern hardwood veneered door possible.

The Use of Veneer in Trunk Work

It is estimated that there is used in the making of trunks and valises nearly 75,000,000 ft. of lumber annually. This, of course, is presumed to cover the entire lumber item, including veneer, built-up work from veneer, and also the solid lumber. There was a time in the past when practically all of the lumber used for trunks was solid, but beginning about twenty years ago, with trunk tops, and gradually extending to sides and the frame work in general for trunk bodies, veneer has gradually crowded out solid lumber, until to-day the majority of wood used comes in the form of veneer or built-up stock. So of this 75,000,000 ft. it is perhaps safe to figure that 50,000,000 ft. is veneer, including the veneer for tops, body work and trunk strips. In the valise trade there is perhaps more veneer used, too, than many are aware of, for it enters into the making of bottoms and the stiff part of the valise frame, and when we consider the total of the valise product it makes quite an item in plain and built-up veneer. Some of the stock is used single-ply, but the best product in this, as in box-making, is that made of three-ply. In the trunk trade, in addition to the use of veneer for the body proper, there has, during the last few years, developed an extensive use of built-up stock for the hangers and fittings of the wardrobe type of trunk. This work is to-day calling for a surprisingly large quantity of built-up stuff in veneers, and it is a class of work that is very desirable and in which efforts should be made to increase the consumption. Taken altogether, the trunks and valises of the country make up quite an important item in the consumption of plain veneer and plain built-up stock.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

Hoffman Bros. Co.

Estab. 1867, Incor. 1904—"Nuff said"

Reg U S Pat Off

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS,

1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—SPECIALTY—

Indiana Quartered Oak

Reg U S Pat Off

Sawed Quartered Oak Veneers

WHITE OR RED—HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

WRITE US FOR PRICES

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

MAHOGANY

Mexican, African, Cuban

Circassian Walnut

As direct manufacturers of Mahogany from stump to consumer we are able to offer better stock at lower prices than can be obtained elsewhere.

Ask us to have a traveller call with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,

Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE
VENEERS
BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - **Ohio**

Write for a quotation on this space—it will put you in touch with veneer manufacturers.

Goshen Veneer Co.
GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for
Poplar and Red Gum Veneers and Crossbanding

MAHOGANY VENEER—Sliced and Sawed

The wise buyer is making his selection NOW, while stocks are fairly large and the old prices prevail.

That condition will come to an end soon, for no veneer logs are coming in, and there is no certainty when shipments will be resumed.

We have Mexican and African Mahogany veneer in all thicknesses; do you care to see our samples?

HUDDLESTON-MARSH LUMBER CO., 2256 Lumber [illegible]
CHICAGO, ILL.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES— - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS

American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

* Band Mills and Offices:
BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM Quartered	RED GUM Plain
3 cars 4/4, 1's and 2's	4 cars 4/4, 1's and 2's
2 " 5/4 "	2 " 5/4 "
1 car 6/4 "	1 car 6/4 "
1 " 8/4 "	1 " 8/4 "
3 cars 4/4 No. 1 Com.	1 " 10/4 "
1 car 5/4 "	2 cars 4/4 No. 1 Com.
1 " 6/4 "	1 car 5/4 "
1 " 8/4 "	1 " 6/4 "
1 " 10/4 "	1 " 8/4 "
	1 " 10/4 "

THE FAMOUS CACHE RIVER GUM
Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.
Huntington, West Virginia

The Glue Book

What It Contains:

Chapter 1—Historical Notes
Chapter 2—Manufacture of Glue
Chapter 3—Testing and Grading
Chapter 4—Methods in the Glue Room
Chapter 5—Glue Room Equipment
Chapter 6—Selection of Glue

Price 50 Cents

Woodworker Publishing Co
Limited
Nicholls Building, Toronto

Thickness for Cross-Banding

THE question, which is the most desirable thickness for cross-banding, is one that cannot be answered off-hand, as much depends on the kind of work for which it is intended. In the first place, what is the object of using cross-banding, asks Wilfred Mack, in Veneers. When we have settled in our own minds our reasons for using cross-banding, we will be better able to decide on which thickness will be most likely to meet our requirements.

I take it that the majority of those who use cross-banding do so to add strength and durability to the article veneered. If this is so, then the amount of additional strength required will determine the thickness of the cross-banding required.

All wood is influenced by atmospheric changes, and has a tendency to expand and contract in the different degrees of temperature and humidity. The extent to which wood is affected is determined, among other things, by the thickness of the wood. If the wood is thin it will respond quite readily to slight atmospheric changes, but if the wood is thick it will do so more slowly in proportion to the thickness. There is, however, this difference between the thick and the thin wood: While the thin wood will respond more readily to atmospheric changes than will the thick, it is much more easily held in check; and the thick wood, though very slow to respond, moves with a force in proportion to its thickness when once it starts, and, to hold it in check, a force equal in strength must be opposed to it.

If we were making ¼-inch panels, five-ply, no matter what thickness of veneer or cross-banding we used, the centre or core would necessarily be thin, so that no very great force would be required to prevent expansion or contraction under atmospheric changes. But take a large sideboard top that is 1¼-inch thick and a tremendous resisting force would be required to prevent it yielding to these outside forces.

In the case of this panel thin cross-banding will answer, the principal requirement being that the core stock be properly cleaned up in order that in the preparation of the cross-banding for the face veneer no allowance will have to be made for a poorly-prepared core. In order to make the best work each process should have nothing to do but look after itself and prepare itself for the process which is to follow, and not have to remedy the defects in the preceding process.

In the case of the heavy sideboard top, when it begins to expand or move in any way, the force is almost, or at least comparatively, irrisistible, and anything less than a strong opposing force would be useless. A thin 1/24-in. cross-banding on a top of this kind would be as a breath against a north gale. If the cross-banding is elastic enough to expand in unison with the core, it is a harmless and useless appendage; but if it should break, as I have known it to do, then the result is worse than useless.

It follows that in order to accomplish the purpose for which cross-banding is used, a thickness must be used in proportion to the thickness of the core and the force it will have to resist.

In the use of heavy cross-banding there is danger of making bad matters worse unless it is used in the proper way. The very strength that gives it a resisting power may become a destroying force, if not properly cared for. Some time ago a manufacturer showed me some goods that had the veneer broken across the grain and asked me if I could explain the cause. I examined the edges and found that the cross-banding was ⅛-in. I also noticed that some of the sheets were not close together at the edges; in fact, that some of them were as far apart as ¼-inch.

I drew the manager's attention to this and he said he could not see any connection between these poor joints in the cross-banding and the broken face veneer, because the breaks in the face veneer were not near the joints. But I explained to him that while these poor joints were not the cause of the trouble in the face veneer, they pointed to the actual cause. These open joints were not left so intentionally. The man who laid the veneer left these joints a little apart, but intended the cross-banding should swell sufficient to bring the edges together. The cross-banding, however, contained more moisture than was thought for, and the result was the sheets did not swell as much as he expected they would.

"But what has that got to do with these breaks in the face veneer?" asked the manager.

"So far, nothing," I replied, "but I am coming to that point. This cross-banding which contained so much moisture was already expanded to the limit, consequently did not expand further after coming in contact with the glue. Now this expansion at this stage of the process meant contraction during the process of drying out. During the process of shrinking it divided up into pieces, and wherever it separated it broke the face veneer."

The heavy cross-banding, rightly used, would hold in place a very heavy core body; but wrongly used, it became a source of danger, and broke and spoiled the face veneer.

Woods of Silver Grain

WOODS having the "silver grain," or as called by botanists, "medullary or pith rays," possess another sort of ornamentation, namely, a sort of dappled effect, or an effect similar to that produced on silk by threads running crosswise to those longitudinally disposed. The European oak, variously known as English oak, Riga and Dutch wainscot, Austrian wainscot, etc., has this peculiarity. In the oak plank the principal streaks or lines are the edges of the annual rings, which show, as usual, parallel lines (more or less waved) from the curvature of the tree or the neighboring knots and branches. The damask pencilings, or broad, curly veins and stripes, are caused by groups of the pith rays, which undulate in layers from the margin to the centre of the tree, and creep in between the longitudinal fibres.

If the fibres in the wood were arranged with the uniformity and exactitude of a piece of plain cloth, there would be an even, uninterrupted color, but since they are arranged by nature in irregular curved lines, every action of the tools partly removes some and exposes others, thus causing a great variety of figure. To pose others, thus causing a great variety of figure. To such a boundless extent do the changes caused by tints, fibres, curls, knots, etc., exist that the users of fancy woods scarcely ever seek to watch pieces for the purpose of producing uniformity of figure. Diversity in figure is often more pleasing to the eye than uniformity would be, if it were practicable.

Glue jointing with a rip saw is not only possible, but it is a practical idea that is deserving of more earnest attention.

Trade Happenings and Opportunities

Woodworking News from Coast to Coast

The sawmill owned by Mr. B. F. Smith at Florenceville, N.B., was recently destroyed by fire.

The Sarnia Saw Mills Company's mill at Sarnia, Ont., was destroyed by fire recently at a loss of $60,000.

Arbuthnot Brothers' sash and door factory at Victoria, B.C., was recently destroyed by fire, the loss being $10,000.

The A. B. Cushing Company, Limited, has been incorporated, with head office at Vancouver, B.C., and authorized capital of $20,000.

The White Pine Lumber Company, Spokane, Wash., will build a large mill at Westbridge, near Greenwood, B.C., where they have a townsite.

The Verdun Broom Company, Montreal, Que., has been registered. Messrs. Geo. Odesse & Ochille Dumas are the provisional directors.

The Cleveland-Sarnia Saw Mills Company, Limited, suffered a loss of about 250,000 feet of lumber in a fire in their yards at Sarnia on 8th inst.

The factory of the Sunset Sash & Door Company, Vancouver, B.C., was damaged by fire last month at a loss of $8,000.

Messrs. T. G. Galarneau and L. L. Lariviere have been registered for the purpose of carrying on the carriage manufacturing business at Montreal.

The Geo. McLagan furniture factory at Stratford, Ont., has resumed operations, following the installation of new boilers and other improvements to the plant.

The North Battleford Manufacturing Company's sash and door factory at North Battleford, Sask., was recently destroyed by fire, the loss amounting to $25,000.

The Algoma Timber and Lumber Company, of Sault Ste. Marie, Ont., has been incorporated with authorized capital of $120,000. Mr. William E. Brown is the company's attorney.

Two Toronto men, Messrs. Watt & Gibson, are said to be contemplating the building of a planing mill and lumber yard at North Regina, Sask., at an estimated outlay of $15,000.

The Field Lumber Company, Limited, Field, Ont., has been incorporated with an authorized capital of $50,000. Those interested include Z. Morean, Sturgeon Falls, and J. U. Lamarre, Field, Ont.

The Canadian Pacific Lumber Company, Port Moody, B.C., recently lost about 1,500,000 feet of lumber by fire. The total loss is estimated at about $20,000. The mill and dry kilns were not damaged.

The ratepayers of Goderich, Ont., have approved a by-law guaranteeing bonds of $25,000 to assist J. E. Baechler, who will make extensive additions to his furniture factory, the whole costing some $50,000.

It is reported that Messrs. J. & C. Low, contractors, Ottawa, are going to rebuild the planing mill which was destroyed by fire some time ago. It has not been decided, however, whether they will build on the old site.

The shingle mill belonging to Messrs. Langs & Roddis at South Sumas, B.C., was destroyed by fire recently, together with about three carloads of shingles. It is not reported whether the company intend to rebuild.

In the opinion of Mr. J. B. Mitchell, an official of the provincial timber department, from seven to ten billion feet of merchantable timber has been made accessible between Squamish and Lillooet by the construction of the Pacific Great Eastern Railway.

The Dominion Government is constructing a new dock at Port Coquitlam Railway Company, Limited. The approach will be 300 feet in length, with a "T" 40 x 40 feet, standing well out in deep water. The dock will have a freight shed 16 x 24 feet in size.

A stave mill at St. Thomas, Ont., owned by the Sutherland, Innes Company, Limited, of Chatham, Ont., was recently destroyed by fire. The mill had been for sale for some time, and practically all the machinery had been removed. The loss is covered by insurance.

Mr. A. Williams, of Vancouver, is president of the Colonial Sash and Door Factory, which recently started operations at Huntingdon, B.C., R. L. Gallinger, the manager, has had thirteen years' experience in the Puget Sound country, while H. M. Morris, another associate, is a practical man from England.

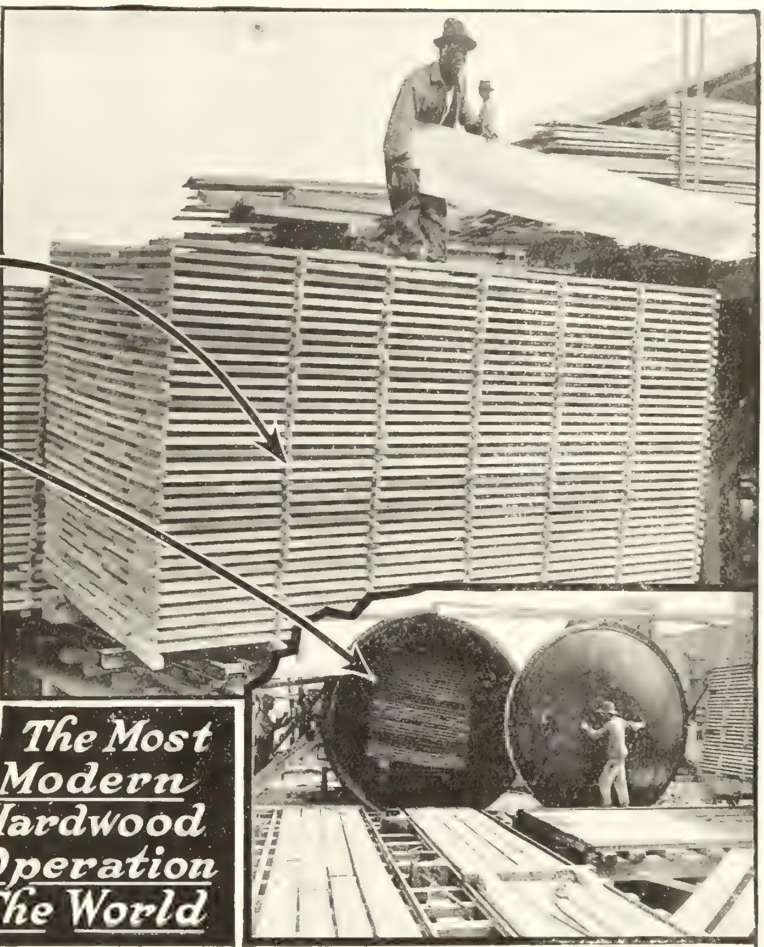
The firm of Messrs. Dickson & Howes, cabinet makers and fixture builders, Victoria, B.C., have secured a contract said to amount to several thousand dollars, from Angus Campbell & Company, Limited, who are installing a new system of stock and fitting rooms. The fittings will be built of mahogany, with heavy plate glass and bevelled mirrors.

The Fernridge Lumber Company, of New Westminster, B.C., who recently lost their plant by fire, report that the loss was approximately $200,000. The insurance amounted to $92,000. At present they have not decided whether they will rebuild, but they say that they have a large quantity of timber, about six miles of standard gauge railway, and all their logging equipment, so that it is more than likely they will rebuild.

From the Morton Dry Kiln Company, heating and ventilating engineers, Chicago, we have received a booklet designed to cover the subject of moisture in wood and to describe instruments recently perfected for determining accurately the exact moisture condition of green, air-dried and kiln-dried lumber. The opinion is expressed that eventually as much attention will be given to this matter of moisture conditions in lumber as to the grade and quality and that every woodworking industry buying lumber from the mills will be provided with some means for determining the moisture conditions of the lumber, and be prepared to sell or buy it on the basis of moisture test as well as grade. It is claimed that the Troemroid Scalometer described in this booklet meets the most exacting requirements. An inter-

¶ If you are interested in LIVE FEATURES do not overlook the Woodworker Essay Competition. The closing date of Contest No. 1 is September 30. See page 13 of this issue.

Cut Straight Stuck Straight Cured Straight And Dried Straight...



The Most Modern Hardwood Operation In The World

THATS WHY-WE CAN GUARANTEE EVERY·BOARD

IT NEVER LEAVES THE TRUCK UNTIL IT IS --LOADED IN THE - CAR·EVERY BOARD - IS BRANDED THE-- THE KRAETZER - CURED LUMBER CO·& MARKED WITH THE - GRADE·WE STAND - BEHIND THE GUARANTEE

THERE is a secret about the manner in which *the superiority* of our product is secured, but we want you to share it. We want you *to know: to understand.*

Our timber is large virgin growth, of *exceptional quality.* There is *none better.* We have the most modern equipment obtainable. The manufacture is *closely watched,* and every detail is given the closest possible *care and attention.* Every board is *properly* Kraetzer-cured. The curing (or treating) of lumber by steam is as old as the use of lumber itself. The *beneficial results* are thoroughly understood and appreciated by those who have used lumber that was *properly* treated.

The real innovation at our mill and the *reason* for the superiority of our lumber, and our ability to *guarantee it,* is the - *before and after* - treatment; the original *high grade* timber, the *careful* handling and grading; the *perfect* sticking; the side ventilated drying stacks, and the *elevated* drying tracks, with *every pile on wheels.*

Try some of our lumber, then you will know *it is* better. Come and see how we do things, then you will *understand why.*

Insist on "*the guaranteed lumber*".

Look for the brand THE KRAETZER-CURED LUMBER CO. **on every board.**

THE KRAETZER-CURED LUMBER CO--

-· MOORHEAD MISS ·-

WRITE TODAY FOR A SAMPLE CAR LOAD — —

[illegible] feature of the booklet is a special table giving the characteristics of forty-five species of commercial woods.

From Stanley Lightfoot, patent solicitor and attorney, Toronto, we have received a copy of a new booklet on patents, designs and trade marks. This little work is written clearly and concisely. It is intended especially for the guidance of inventors and manufacturers making application for patents. The matter is well arranged and many important points are explained. We recommend those of our readers interested in the matter of industrial protection to secure a copy of this booklet, which is most informative.

The products of the Galt Knife Company, Limited, Galt, Ont., are described and illustrated very clearly in an interesting booklet which may be obtained on application. The company has a wide range of machine knives, circular cutters and shear blades which have established a reputation for efficiency. The catalogue contains many pointers which the practical man should find suggestive.

Wood-Using Industries of the Maritime Provinces, Bulletin No. 44.—This is an illustrated 100-page bulletin compiled from reports received from over six hundred manufacturers in the Maritime Provinces using wood as a raw material. It reports on the quantity, value, and source of supply of the different kinds of wood used by the industries of the provinces; includes detailed descriptions of the different classes of industries and of the properties of the woods; takes up the ten kinds of wood used in greatest quantity and shows the extent to which the industries respectively use these; and appends a classified directory of the manufacturers who supplied the data used in the compilation. The report is the work of R. G. Lewis, B.Sc.F., assisted by W. Guy H. Royce, and is published under the Forestry Branch, Department of the Interior.

PATENTS
Herbert J. S. Dennison, Patent Attorney and Expert
Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.
Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% PROFIT SHARING
Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to
National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

PATENTS
STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) TORONTO, CAN.
The business of Manufacturers and Inventors who wish their Patents systematically taken care of is particularly solicited.
Ask for new free booklet of complete information.

NEW FACTORY FOR SALE

150 ft. x 200 ft. with 4¾ acres land, located on the outskirts of New Westminster, British Columbia, has C. P. R., G. N. R. and B. C. Electric Railway shipping facilities.

The factory is exceptionally well built and cost $45,330.00 including land. Street cars run by the grounds. There is City water and fire protection, telephones, etc.

In addition to the factory building there is an office building, chemical room and watchman's house.

This property is most suitable for a Match factory, veneer or any other wood-working business, and will bear the closest inspection.

We are instructed by the Creditors to sell this property at once, and shall be glad to consider reasonable offers. This is a snap for anyone desiring such a property.

Terms and full particulars on application.

WESTMINSTER TRUST COMPANY,
Liquidator.
DOMINION MATCH COMPANY, LIMITED,
9-10 New Westminster, B.C.

OVER 65 YEARS' EXPERIENCE
PATENTS
TRADE MARKS
DESIGNS
COPYRIGHTS &C.
Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.
Patents taken through Munn & Co. receive *special notice*, without charge, in the
Scientific American.
A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.
MUNN & Co. 363 Broadway, **New York**
Branch Office, 625 F St., Washington, D. C.

WAR — WAR — WAR
vitally affects the ply-wood business in foreign woods.
As it will be impossible to get further shipments for an indefinite period, we would advise our customers to select their future wants from our present Toronto stock, which is rapidly being diminished.
ALDERLITE: –
3 m/m or ⅛ in. 3-ply 60 x 40 Rotary cut, no joint, 1st quality, $26 per M. ft.
4 m/m or 3/16 in. scant 60 x 40 Rotary cut, no joint, 1st quality, $30 per M. ft.
5 m/m or 3/16 in. full 60 x 40 Rotary cut, no joint, 1st quality, $34 per M. ft.
also size 46 x 38 in 4 m/m & 5 m/m, $2 per M. ft. cheaper.
Less 7½% Trade Discount for second quality.
C. DUPRE & CO., 266-8 King Street West, TORONTO
Sole Agents, Venesta Limited, London, England

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

"Andrews" Dried Lumber
IS BETTER LUMBER

"ANDREWS" Products Represent
Perfection—Reliabilty—Results

"Andrews"
Moist Air
Lumber
Driers

CONDENSING
or
VENTILATED

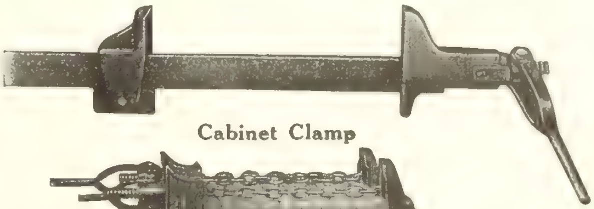
Perfect Transfer Cars
Perfect Dry Kiln Trucks
Canvas Dry Kiln Doors
Double and Single

Write for Information

DRIER DEPARTMENT

The A. H. Andrews Co.
115-117 South Wabash Ave.
CHICAGO

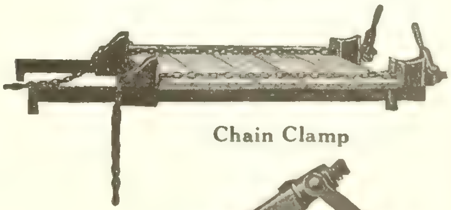
"Pioneer" Moulding Sander
Power Veneer Presses



Cabinet Clamp

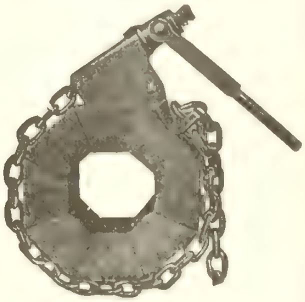
Veneer Press

Write for
Catalogue
and Prices



Chain Clamp

Black Bros.
Machinery Co.
Mendota, Ill.



Column Clamp

BOOKS FOR SALE

The following books are offered at special prices subject to previous sale:

Saw Fitting Manual, a treatise on the care of saws and knives. Deals with everything in the saw and knife alphabet, from adjustments to widths. 144 pages. Price $2.00.

Common-sense Handrailing, by Fred T. Hodgson. Published by Frederick J. Drake & Company, Chicago. 114 pages, illustrated. Price 50c.

oof Framing Made Easy, by Owen B. Maginnis. Published by The Industrial Publication Company, New York. 164 pages, illustrated. Price 50c.

Handrailing Simplified, by An Experienced Architect. Published by William T. Comstock, New York, 52 pages, illustrated. Price 50c.

How to Join Mouldings; or, The Arts of Mitering and Coping, by Owen B. Maginnis. Published by William T. Comstock, New York. 72 pages, illustrated. Price 50c.

The Book of Lumber Shed Construction, by Met. L. Saley. Published by American Lumberman, Chicago. 176 pages, illustrated. Price $1.00.

Furniture Designing and Draughting, by Alvan Crocker Nye. Published by William T. Comstock, New York. 100 pages, illustrated. Price $1.00.

Popular Mechanics Shop Notes, Published by Popular Mechanics, Chicago. Easy Ways to do Hard Things, etc. Years 1905-1906-1907-1908. Price 40c each.

Cabinet Making, by J. H. Rudd. Published by Grand Rapids Furniture Record Company. 210 pages, illustrated. Price $1.50.

Woodworker Publishing Company, Limited
Nicholls Building, Toronto, Ontario

B. C. Fir Timbers
and
Clear Finish Stock
Kiln Dried or Air Dried
Red Cedar Shingles
Write or Wire
W. G. Scrim Lumber Co.
Vancouver, B.C.

Canadian
Hard and Soft Woods
Carefully Selected Stocks Carried
Your Enquiries Solicited
C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

The Atlantic Lumber Co.

Manufacturers and
Wholesale Dealers

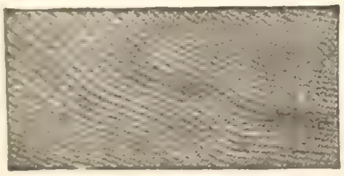
American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers
Phone Main 6386 - TORONTO
HOME OFFICE, BOSTON, MASS.
Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Archer Lumber Company
HARDWOOD LUMBER
Helena, Ark.

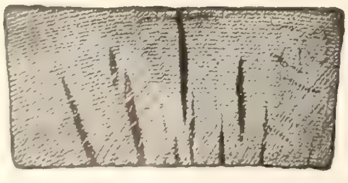
PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM
4/4 13-17 in. Boxboards 28718
4/4 18 in. and up Panel 33905



Every kind and form
of
DRYING LUMBER

Grand Rapids Dry Kiln
QUALITY DRYING
Grand Rapids
Mich. - U. S. A.



Plain Sawed Oak
Mills in West Virginia and Kentucky
Wilcox & Knapp
Conneautville, Pa.
Quotations Cheerfully Furnished

INDIANA HARDWOODS

Write for a quotation on this space—
it will put you in touch with
hardwood consumers.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

J. V. STIMSON

All kinds of

Hardwood

Lumber

MANUFACTURED

HUNTINGBURG - INDIANA

Mills at ***Owensboro, Ky.,*** and
Memphis, Tenn.

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker." They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY
Cincinnati, Ohio

OAK
5 cars 4/4 No. 1 and No. 2 Common Plain

DIMENSION STOCK
We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT
4 cars 4/4 Sound Wormy

BASSWOOD
2 cars 4/4 Log Run

YELLOW PINE
5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller Lumber & Veneer Co.
CINCINNATI -:- OHIO

Manufacturers of

Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.
CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR
Extra Wide 1, 2, 3 and 4 inch 5/8″ PANEL STOCK
6″ x 6,″ 7″ x 7″ and 8″ x 8″ Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati, O.

We Make the Best Lumber
that modern equipment and a perfect organization can produce.

Our Oak is soft in texture, even, white in color and our Quartered Oak cannot be excelled for figure.

The Mowbray & Robinson Company
"Manufacturers"
Cincinnati, Ohio

YARDS:
Chicago, Ill.
Detroit, Mich.
Rochester, N. Y.
Brooklyn, N. Y.
Cincinnati, O.

MILLS:
Quicksand, Ky.
West Irvine, Ky.
Viper, Ky.
Hombre, Ky.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO

Mills:
Kentucky Tennessee
W. Virginia

—We make a specialty of—

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

We carry large stocks of Oak, Poplar, Chestnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Immediate Shipment

West Virginia Stock

Thoroughly Dry and Well Manufactured

1 car 4/4 1s and 2s, Plain White Oak.
4 cars 4/4 No. 1 Common Plain White Oak.
2 cars 4/4 No. 2 Common Plain White Oak.
1 car 4/4 No. 1 Common and Better Plain White Oak.
Worm holes no defect.
1 car 6/4 No. 1 Common Plain White Oak.
6 cars 4/4 S. W. Chestnut.
1 car 5/5 S. W. Chestnut.
4 cars 6/4 S. W. Chestnut.
1 car 8/4 S. W. Chestnut.
3 cars 4/4 No. 3 Common Chestnut.
1 car 4/4 No. 1 Common and Better Chestnut.
½ car 8/4 No. 1 Common and Better Chestnut.
1 car 4/4 Saps and Select Poplar.
2 cars 4/4 No. 2 Common and Better Poplar.
1 car 5/4 No. 2 Common Poplar.
1 car 6/4 No. 2 Common Poplar.
1 car 4/4 No. 2 Common and Better Birch.

We solicit your inquiries on special cut bill Oak.

Mill at Holly Junction, W. Va.

Write at once for Quotations. **The Price is Right.**

The Imperial Lumber Co.

Columbus, :-: Ohio.

DUHLMEIER BROTHERS

Mills—TENNESSEE ARKANSAS **Main Office & Yard—CINCINNATI, OHIO, U. S. A.**

OAK and RED GUM

OUR SPECIALTY

Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

At our Tennessee mill we are producing some choice Band Sawn

Plain and Quartered Red and White Oak, Poplar

Prompt Shipments and High Grades our Hobby. **Mahogany** Let us quote you on your requirement

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

ABRASIVES
The Carborundum Co., Niagara Falls, N.Y.

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.

BAND SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto.

BOX MAKERS' MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

EDGERS (Gang)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons Limited, Galt, Ont.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Son, Baxter D., Winchendon, Mass.

FILLERS
German-American Stain Co., Grand Rapids,
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GARNET PAPER AND CLOTH
The Carborundum Co., Niagara Falls, N.Y.

GRAINING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE ROOM EQUIPMENT
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS, HAND AND FOOT POWER
The Carborundum Co., Niagara Falls, N.Y.

GRINDERS (Knife)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GRINDING WHEELS
The Carborundum Co., Niagara Falls, N.Y.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Pyribil Machine Co., P., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Imperial Lumber Co., Columbus, Ohia.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Kraetzer-Cured Lumber Co., Moorhead, Miss.
Mowbray & Robinson, Cincinnati.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Prendergast Co., Cincinnati, Ohio.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Talbert-Zoller Lumber & Veneer Co., Cincinnati.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.
Wilcox & Knapp, Conneautville, Pa.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.

KNIVES (Planer and others)
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Galt Knife Co., Galt, Ont.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

MACHINE KNIVES
Berlin Machine Works, Ltd., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.

PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

RESAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P. Q.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SANDERS
Berlin Machine Works, Ltd., Hamilton, Ont
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SAW GUARDS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pyribil Machine Co., P., New York.

SAW GUMMERS, ALOXITE
The Carboroundum Co., Niagara Falls, N.Y.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

SAW JOINTERS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill
Pyribil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Berlin Machine Works, Ltd., Hamilton, Ont
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Petrie, H. W., Toronto
Pyribil Machine Co., P., New York.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHARPENING TOOLS
The Carborundum Co., Niagara Falls, N.Y.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Louisville Blow Pipe Co., [illegible]
Sheldons Limited, Galt, Ont.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Berlin Machine Works, Ltd. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

TRIMMERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company, Cincinnati, Ohio.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dupre & Company, C., Toronto.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Talbot-Zoller Lumber & Veneer Company, Cincinnati, Ohio.
Thompson Veneer Co., W. T., Edinburgh, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

WHEELS, Grinding, Carborundum and Aloxite
The Carborundum Co., Niagara Falls, N.Y.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

WOODWORKING CUTTERS
Galt Knife Company, Galt, Ont.

YELLOW PINE
Prendergast Co., Cincinnati, Ohio.

"Cabinet-Making"

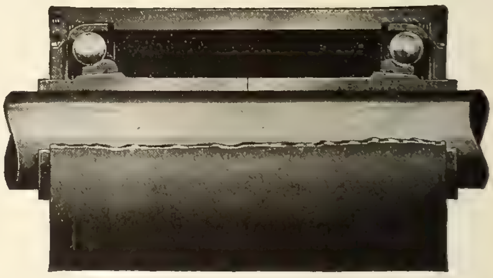
For the Worker in Wood, the Successful Teacher and the Ambitious Student.

By J. H. RUDD

Has been written to fill a need long felt wherever the principles of the trade have been applied. "Cabinet-Making" is not an elementary treatise for the man who would make his own furniture, but a text book in the more difficult manufacturing problems of the art for the man in the factory, at the manual training desk or in the school-room. The book is tersely written, with a freedom from technicalities and an adaption to the various phases of the field that will make it practical to you, if you are a Maker of Things From Wood.

Post-Paid, $1.50

Woodworker Publishing Co., Ltd.
Nichols Building, Toronto, Canada.



Your Loose Pulley Trouble Disappears.

when installed with

CHAPMAN BALL BEARING LOOSE PUL EYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS GLUE

(VEGETABLE)

SETS—STICKS—STAYS

Vegetable Glues differ as do animal glues.

Don't take any chance.

Start right—with the Atlas.

We are willing to show you.

WRITE NOW.

National Process Company
Manufacturers
Address Dept. C. Indianapolis, Indiana, U. S. A.

℞ For satisfactory lumber drying—
Get the basic principle right,
then get the drying elements
under absolute control.
Dr. X. Perience

THE Standard Moist Air Dry Kiln exactly fills this prescription of Experience. Convincing proofs of its complete success in drying all varieties of HARDWOODS will be sent, with the catalog, on request. Address: The Standard Dry Kiln Co., 1560 McCarty St., Indianapolis, Ind.

PERKINS
VEGETABLE GLUE

Is better than any glue made for built-up-stock and veneer laying.

It is applied without heat and does away with heat in the glue room.

It is being used by many of the largest manufacturers of high-class furniture in this country.

We can save you 20% of your present glue bills and give you better work besides.

If you are interested or doubt anything we have said, drop us a line. We will send you full particulars and give you the names of some of our customers—in the same line as you—who will be glad to give you their frank opinion. Go into this matter right now, while you think of it.

It's worth investigating

Perkins Glue Co.
809 J.M.S. BLDG.
SOUTH BEND
INDIANA

GOOD NEWS FROM MARIETTA

In spite of the European war we can still fill orders for **UNIFUME**, *the ideal fuming liquid to even up sap streaks*—

— and

FUMED OAK ACID STAINS.

At present, we can supply our own trade with these goods at regular prices.

We advise prompt action if you want to protect yourself against the future WAR shortage.

The Marietta Paint & Color Co.,
Marietta, Ohio.

Volume Fourteen TORONTO, OCTOBER, 1914 Number Ten

CANADIAN WOODWORKER and Furniture Manufacturer

SCRAPING Flat Hard Wood Surfaces, Solid or Veneered
on a
WHITNEY Wood Scraping Machine

is a faster process;—costs are lower and results better than you can obtain by any other means or method—sanding or hand scraping

¶ Ask us for some samples of hard woods passed through a Whitney Scraper so that you can see the beautiful grain effects—the open pores of the wood—the smooth even surface without scoured out spots and rounded corners.

¶ Or, better still, send us some samples of the woods you are working and compare the finish of Whitney Scraper work we send you with the work you do by your method.

¶ The low cost of operating a Whitney Scraper and the speed at which it works are worth considering. ***Write us about it***

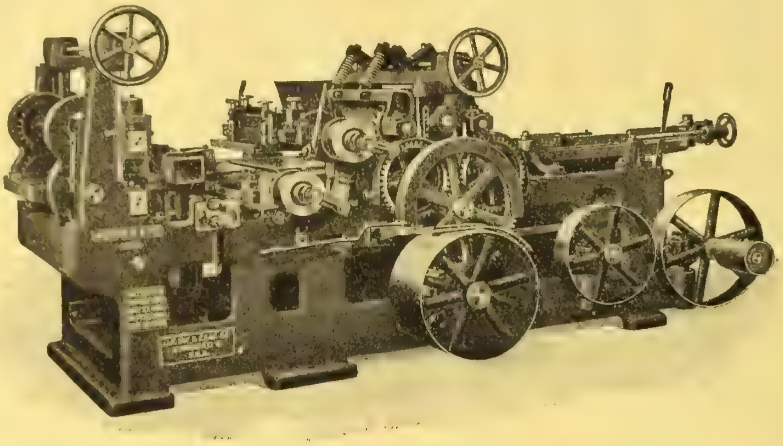
BAXTER D. WHITNEY & SON - Winchendon, Mass.

California Office: Berkeley, California.
North Pacific Coast Office:
Stetson-Ross Machine Works, Seattle, Wash.

Selling Representatives:
Henry Kelley & Co.,
26 Pall Mall, Manchester, England

Alphabetical Index to Advertisers, Page 8

Our Claims For The FAY-EGAN "Lightning" No. 275 Sustained



J. A. Fay & Egan Co., Cincinnati, Ohio.

Gentlemen:—We purchased one of your No. 275 Matchers, size 16 x 8, a little over a year ago and have been running it continually ever since working all sorts of material on it from ½" ceiling to sizing 16x8 timbers. In fact, most of the time it has been doing the work of a timber sizer and I must confess in all of my 25 years' experience, I have never seen its equal for amount of work it will turn out. It has the most wonderful feed for its size and I have run all makes of machines.

No one need be afraid of buying one of these machines for general all around work and I heartily recommend it to any wanting such a machine. We have not had a cent of repairs and if we could not secure a duplicate of it, would not take twice the amount we paid for it.

We congratulate you on the development of such a machine and wish you the hearty success you deserve. We are also well pleased with the other machines we purchased from you. Yours very truly,

SHAW BROS. COMPANY, Macon, Ga.
By David Shaw, President.

This medium weight and medium priced machine is daily proving our claims as the greatest general purpose Planer and Matcher.

Actual results obtained on the No. 275 are the strongest proofs of the value of this machine—note in the letter, herewith, the wide range of work—½" ceiling to sizing 16 x 8. In other mills, the 275 has taken care of any work, either soft or hardwoods within the limit of its capacity.

Besides matching and surfacing, it will make flooring and moulding up to 1¼" deep.

The initial cost and operating expense of the 275 are well within the means of every planing mill and factory owner and once installed, it will make big money and pay for itself.

There are many mill owners who owe their success to the adaptability of their 275 to all classes of work.

If you need or use a general purpose Planer and Matcher, let us tell you more about the 275—write for Bulletin C-8 today.

J. A. FAY & EGAN COMPANY

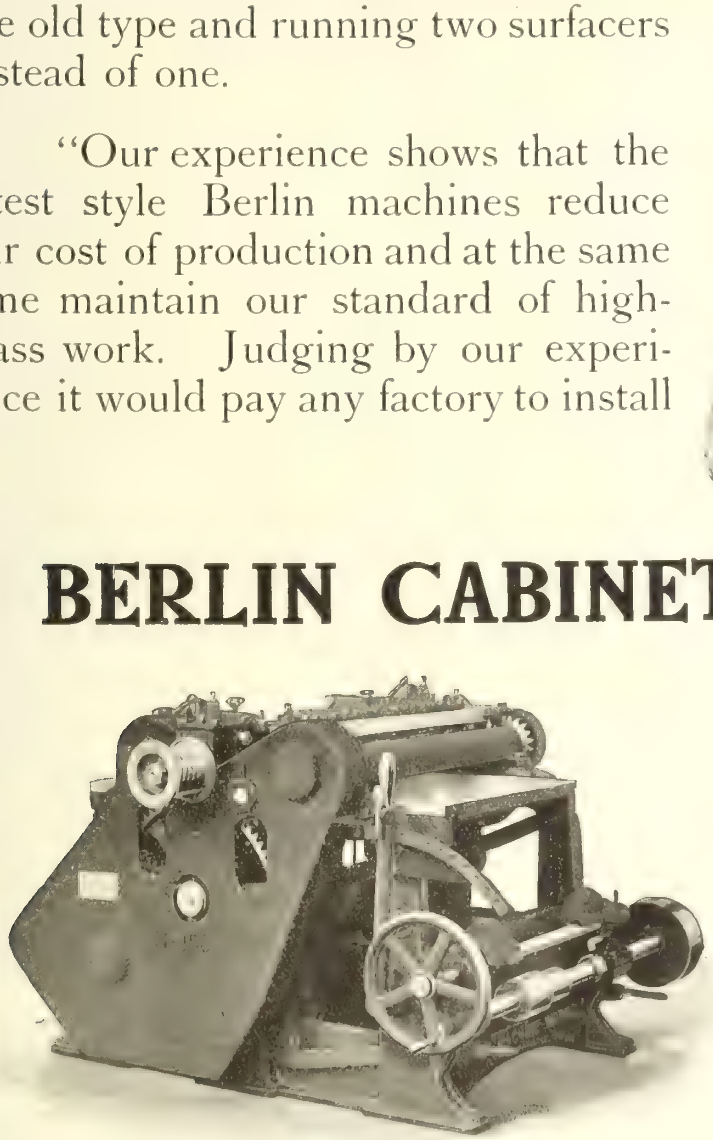
153-173 W. Front St., CINCINNATI, OHIO

"That's the machine I installed. It's the Berlin Cabinet Surfacer with round heads and thin knives.

"I bought it because it does the fine, smooth planing we require at double the speed of our thick-knife surfacer. Buying this Berlin machine saved me from putting in another of the old type and running two surfacers instead of one.

"Our experience shows that the latest style Berlin machines reduce our cost of production and at the same time maintain our standard of high-class work. Judging by our experience it would pay any factory to install a

BERLIN CABINET SURFACER



Profit by the experience of this and other factory men who have installed the Berlin thin knife round cutterhead cabinet surfacer. They have reduced both their surfacing and sanding costs. And the quality of work performed has been raised at the same time.

Where stock is worked in short lengths have your Berlin cabinet surfacer equipped with hopper feed. That will assure the maximum production, the finest work and the lowest cost.

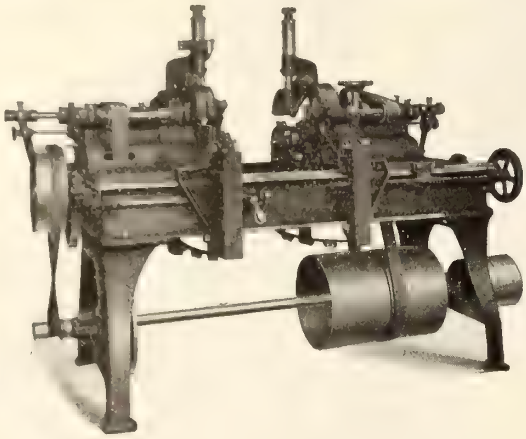
This is a matter to investigate without delay. To begin with ask for descriptive circulars.

Berlin Machine Works, Hamilton, Ontario

Largest manufacturers of wood-working machinery in the world

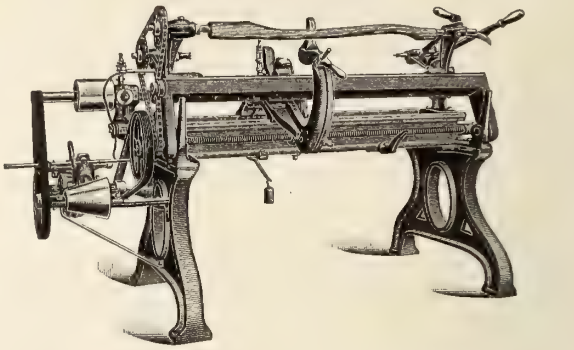
U. S. Plant - Beloit, Wis.

Better Spokes and More of Them



The new Nash Spoke Machine for equalizing and chucking tenon will help you improve product and cut cost.

J. M. NASH, Milwaukee, Wis.



Once **tried** always **used**

The Ober Handle Machinery

Turning Lathes, Sanders, Shapers, Rip and Cut off Saws, Bolting Saws, etc., for making handles of various kinds

Neckyokes, Spokes, Wiffletrees, Ball Bats, Table Legs, Spindles, etc.

Write for free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS, O., U.S.A.

Carborundum Brand Garnet Paper and Cloth

YOU are sanding right when you show a uniformity of finish—a saving of time—an increased production.

Carborundum Brand Garnet Paper and Cloth

Are so uniformly coated with sharp, clean grain—cut so clean and fast, show such long life that they will help you towards these ideal sanding conditions.

……

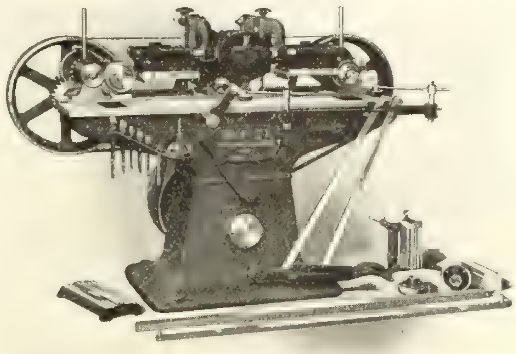
Glad to send working samples

……

The Carborundum Company
Niagara Falls, N. Y.

New York Chicago Boston Philadelphia Cleveland
Cincinnati Grand Rapids Milwaukee Manchester, Eng.

DUPLEX MOULDING SANDER



This machine will sand mouldings and interior trim with a continuous feed from the smallest one quarter round up to eight inches in width.

The only machine for sanding FINE LINE MOULDINGS AND TRIM.

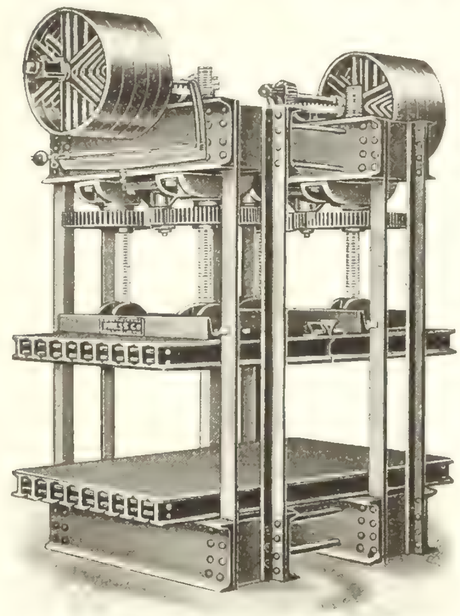
—SPECIALTIES—

DUPLEX MOULDING SANDER
DUPLEX DOUBLE EDGE SANDER
DUPLEX BELT SANDER

Manufactured by

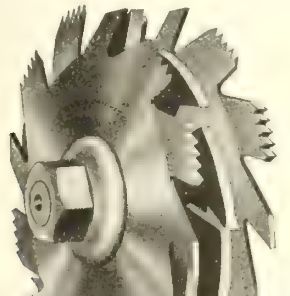
Duplex Moulding Sander Co.
Hornell, N. Y., U. S. A.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL



Patented Nov. 29, 1890
July 19, 1912

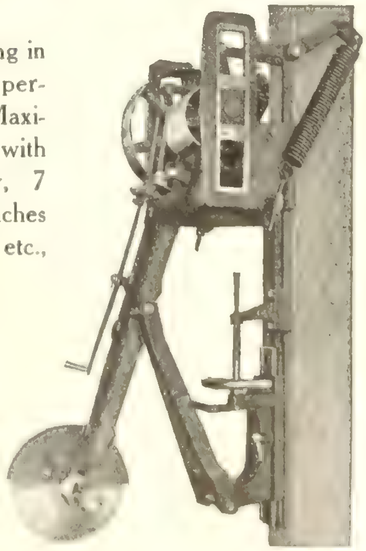
A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co. Toronto — Canadian Agents — Williams & Wilson Montreal

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

PRYIBIL No. 5 Parallel Saw and Groover

This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.



P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

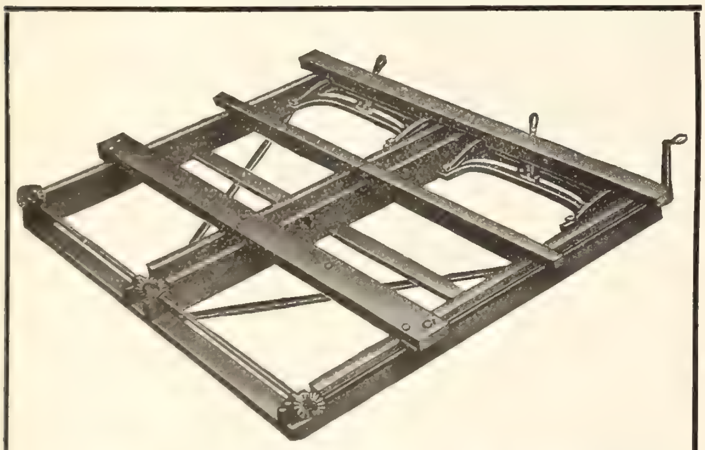
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, MacLean Building, Toronto, Canada.



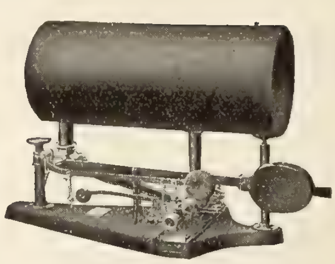
GRAND RAPIDS

Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.



Encore! Encore!

Encore is a French word which means once more. It signifies approbation and calls for a repetition of a performance or achievement. Hundreds of the country's largest steam users have signified their approbation of the performances and achievements of the

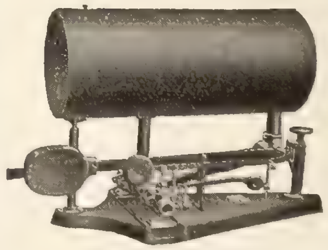
Morehead Back to Boiler SYSTEM

by calling for Moreheads again and again. The John B. Stetson Hat Co., for instance, has purchased 60 Moreheads since 1909; the Studebaker Co. 15, in less than three years, etc. Must be some good reason for it, don't you think? There is. The Morehead System SAVES—that's why: saves in fuel, time, money and labor. Returns every drop of condensation in the steam apparatus back to the boilers as feedwater—without pump or injector—and at a temperature up to 330 deg. F.

Our engineers will give you the complete information and show how the Morehead can save for you.

WRITE TODAY—RIGHT AWAY

Canadian Morehead Mfg. Co., Limited
Woodstock, Ont.



Essay Contest No. 2 (December)

Bi-Monthly Essay Competition

Prizes to the value of Thirty Dollars are offered by the Publishers of the Canadian Woodworker for the

Best Two Essays

on

Subjects of Practical Interest to the Trade

First Prize $20 ***Second Prize $10***

The following must be regarded as the conditions of the competition:

1.—Competitors shall be engaged in some branch of practical woodworking in the Canadian trade.

2.—The subject of the essay shall be at the selection of the competitor, preference being given to topics affording a solution to some practical problem of general interest to the trade or constituting a "short cut."

3.—Drawings (if any) may be sketched roughly, in which case they will be re-drawn at the office of the Canadian Woodworker. Preference will be given to drawings executed neatly in Indian ink.

4 —Essays (of about 1,000 words shall be written or typed on one side of the paper only, leaving ample marginal space.

5.—Articles for the December issue competition must reach the Editor not later than November 30.

6.—Awards shall be made on the basis of practical interest rather than literary merit.

7.—The decision of the publishers in the matter of awards shall be final.

8.—The publishers reserve the right to publish the articles submitted.

To the Reader

The value of such competitions as an idea-getter and as a means of promoting the efficiency of the workman cannot be gainsaid. It is reflected in the many helpful, practical articles submitted in Contest No. 1, the awards of which are announced elsewhere in this issue.

If you held off from the first contest, get in the second. If you entered but were unsuccessful, **try again,** remembering that the secret of success in every phase of human activity is **trying again.** Practice makes perfect, and the exercise of concentration engendered now will bring results later on. The prizes are worth the winning, but whether you are successful or not you cannot fail to derive some return from the effort expended.

We are all striving for increased efficiency in the trade. If we produce better workmen, we raise the status of the industry. Let us have your co-operation. Exchange ideas. If your ideas are solid they will stand criticism; if not you should know wherein they are defective.

You know your trade well enough? Let the trade know you know it, then. It will help.

Address all communications to THE CANADIAN WOODWORKER, 345 Adelaide Street West, Toronto, marking your envelope in the lower left-hand corner, "Competition."

Alphabetical List of Advertisers

Adjustable Clamp Company ... 8
Andrews Company, A. H. ... 47
Archer Lumber Company ... 48
Atlantic Lumber Company ... 48
Ault & Wiborg Company ... 34

Berlin Machine Works ... 3
Black Bros. Machinery Company ... 47

Canadian Boomer & Boschert Mfg. Co. ... 5
Canadian Morehead Manufacturing Company ... 6
Carborundum Company ... 4
Central Veneer Company ... 40
Central Veneer Company ... 42
Chapman Double Ball Bearing Company ... 54
Chicago Machinery Exchange Inc. ... 47
Cincinnati Veneer Company ... 41
Clark Veneer Company, Walter ... 40
Curtis Machine Corporation ...
Cyclone Blow Pipe Company ... 9

Dennison, Herbert, J. S. ... 45
DeVilbiss Manufacturing Company ... 35
Duhlmeier Brothers ... 51
Duplex Moulding Sander Company ... 5
Dupre & Company, C. ... 45

Fay & Egan Company, J. A. ... 2

Galt Knife Works ... 10
Goshen Veneer Company ... 41
Grand Rapids Hand Screw Company ... 6
Grand Rapids Veneer Works ... 45

Haughton Veneer Company ... 39
Hoffman Bros. Company ... 39
Huddleston-Marsh Company ... 41
Huther Bros. ... 5

Imperial Lumber Company ... 51
Invincible Blow Pipe Company ... 9

Kosse. Shoe & Schleyer Company ... 50
Kraetzer-Cured Lumber Company ... 49

Lightfoot, Stanley ... 45

Marrietta Paint & Color Company ... 56
Meakins & Sons ... 34
Morton Dry Kiln Company ... 9
Mowbray & Robinson ... 50

Nash, J. M. ... 4
National Process Company ... 55
National Securities Corporation ... 45
National Veneer & Lumber Company ... 40

Ober Manufacturing Company ... 4
Ohio Veneer Company ... 39

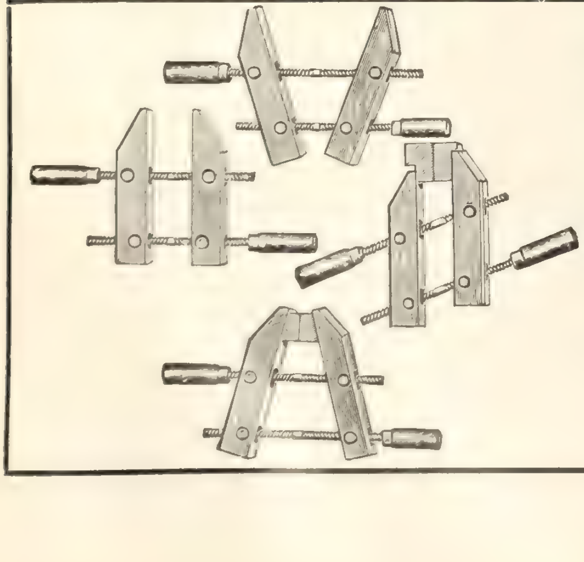
Palmer & Sons, A. E. ... 48
Penrod Walnut & Veneer Company ... 42
Perkins Glue Company ... 55
Perrin & Company ... 48
Petrie, Limited, H. W. ...
Powell-Myers Lumber Company ... 49
Prendergast Company ... 50
Pryibil Machine Company, P. ... 5

Reflector & Hardware Specialty Mfg. Company ... 10
Robertson Manufacturing Company, P. L. ... 10

Scientific American ... 45
Shawnee Lumber Company ... 51
Sheldons Limited ... 54
Shiels & Company, Chas. F. ... 50
Simonds Canada Saw Company ...
Spencer, C. A. ... 47
Standard Dry Kiln Company ... 55
Stimson, J. V. ... 49
Strong Veneer Company ... 6

Talbot-Zoller Lumber & Veneer Company ... 50
Thompson & Company, Lewis ... 40
Thompson Veneer Company, W. T. ... 39
Thompson Hardwood Lumber Company ... 51

Whitney & Son, Baxter D. ... 1
Wilcox & Knapp ... 47



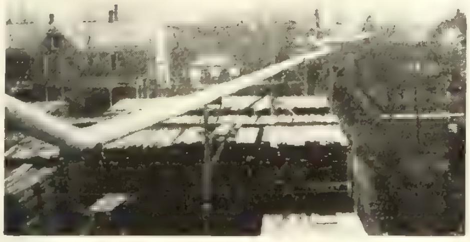
The Jorgensen Adjustable

is considered by every person who has used it to be the best handscrew made. The factories and manual training schools that are supplied with it, profit both in the superiority of the tool itself, and in its economy. We are making a faster handscrew, one that will work on positions impossible with the old style, and by far the more economical. Its many superior advantages should cause it to be specified in your list of supplies. Write for circular and price list.

Adjustable Clamp Company
215 North Jefferson Street, Chicago, Ill.

For sale by all leading hardware dealers in United States and Canada. Oliver Machinery Co., Limited, Manchester, Eng, Agents for British Isles. Frank Vial & Sons, Melbourne, Australia, Agents for Australia. Hammacher, Schlemmer & Co., New York City, Agents for Metropolitan New York.

Slow Speed Low Power Shaving and Dust Collecting Systems



New Systems designed. Old systems corrected.
Long distance blows a specialty.

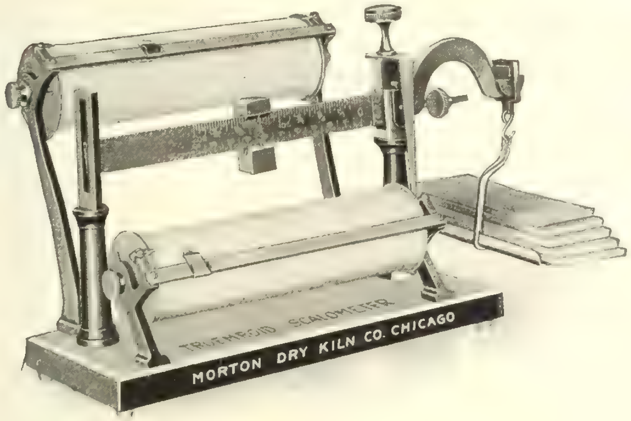
Trained Mechanics. We know how.

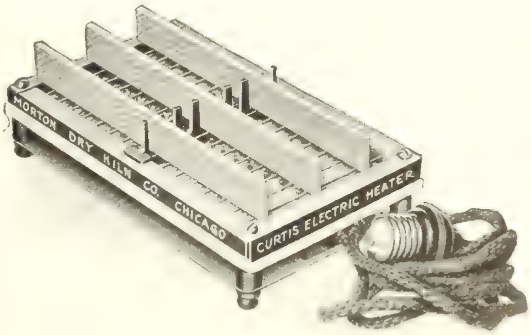
Consult our Expert

INVINCIBLE BLOW PIPE CO.
CHICAGO 176 George St., TORONTO

TROEMROID SCALOMETER

For Testing Percentage of Moisture in Lumber





Model B Made in 3 different styles

Model A For testing air-dried or kiln-dried lumber.. Range ½ of 1 per cent. to 30 per cent. Price $20.00
Model B—For all kinds of lumber from green to kiln-dry. Range ½ of 1 per cent. to 90 per cent. Price 23.00
Model C—For green lumber only. Range 30 per cent. to 90 per cent. Price 20.00

NOTE—Model A and Model C are constructed the same as Model B shown above, except they have only one cylinder and chart.

This cut shows a special Electric Heater—to use in connection with the Troemroid Scalometer, for quickly drying the test pieces.

Price of Electric Heater $3.00

We furnish free with Scalometer and Heater our specially prepared table.

It shows the characteristics of 45 species of commercial woods.
GREEN weight per 1,000 board feet of each wood.
AIR DRY weight per 1,000 board feet of each wood.
KILN DRY weight per 1,000 board feet of each wood.

The percentage of moisture of each kind when green when air dry and when kiln dry. The table also gives other valuable characteristics of each species.

Write for our new catalogue No. 5o of Dry Kiln Instruments.

Morton Dry Kiln Co., 20 W. Jackson Blvd., CHICAGO, ILL.

(Patented)

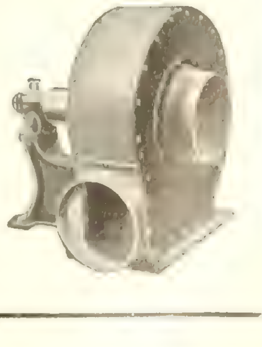
Cyclone Blow Pipe Co.

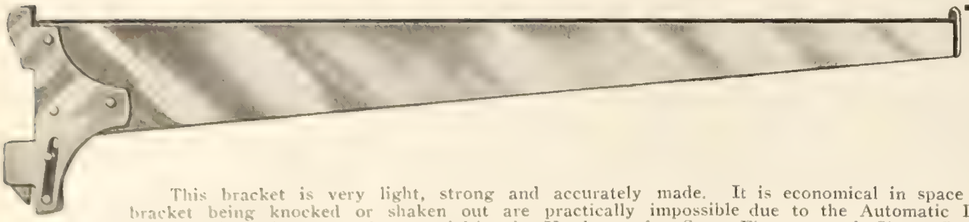
Improved Cyclone Dust Collectors, Automatic Furnace Feeders, Steel Plate Exhaust Fans, Exhaust and Blow Piping.

Complete systems designed, manufactured, installed and guaranteed. Old systems remodeled on modern lines on most economical plans. Supplementary system added where present systems are outgrown. Defective systems corrected and put in proper working order.

Latest Improved Slow-Speed Systems

Cyclone Blow Pipe Co., Chicago, Ill.



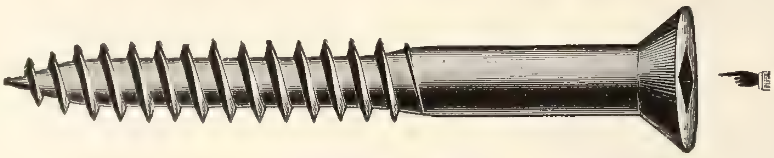


ADJUSTABLE BRACKETS

This bracket is very light, strong and accurately made. It is economical in space and beautifully finished. Accidents from bracket being knocked or shaken out are practically impossible due to the Automatic Locking Device. Send for catalogue describing this and many other specialties in Hardware for Store Fixtures and Show Case manufacturers.

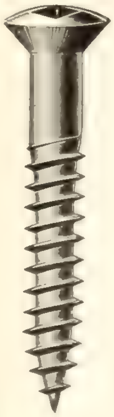
The Reflector & Hardware Specialty Mfg. Co.
Western Ave. and Twenty-Second St. - - - CHICAGO, ILL.

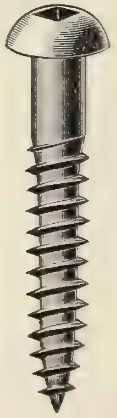
ROBERTSON SOCKET HEAD
Wood Screws



See That Square Hole

Pat. Feb. 2, 1909





THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO

Good Steel, Carefully Manufactured, Scientifically Tempered

Our GLUE JOINT CUTTERS Make a Perfect Joint.
MILLED SHAPER CUTTERS—Any Size or Any Shape. Ask for quotations.
GALT KNIFE COMPANY, LIMITED 99 State Street, Galt, Ontario

Canadian Woodworker

**A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring, woodenware, furniture, pianos, boxes, and general mill products.**

Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

**Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.**

345 Adelaide St. West, Toronto
Phone Ade. 2700

Authorized by the Postmaster General for Canada, for transmission as second class matter.
Entered as second class matter July 18th, 1914, at the Post Office at Buffalo, N.Y., under the Act of Congress of March 3, 1879.

Vol. 14 **October, 1914** **No. 10**

The Middle Course

THE Minister of Finance, Hon. W. T. White, in his recent public utterances, voices the exact sentiments of the more thoughtful of the Canadian people, when he counsels municipalities, railways and large industrial concerns to steer a middle course in carrying out their programmes of expenditure. Mr. White evidently has no sympathy with those manufacturers and others who, at the first sign of trouble, summarily dismiss their employees, and close and bar their doors, thus accentuating the difficulties which others, more loyal and sane, are endeavoring to forestall.

The middle course has already proved an eminently satisfactory one for business men throughout the Dominion. A readjustment is evidently taking place. As Mr. White says, the worst effects are gradually wearing away. Many of our industries have suffered, but on the other hand, many have been greatly stimulated. The higher prices for grain and other agricultural products will more than neutralize the shortage in amount. Increased agricultural production will be inevitable. This has been the great need in Canada for many years and will help to solve the problem of the high cost of living, with its attendant evils—the overcrowding of cities and consequent unemployment. As a result of the scarcity of certain raw materials, new industries will spring up, and with the increased demand for manufactured products, Canada has unexpectedly opened to her the means of becoming recognized as a manufacturing centre. The first duty of every Canadian is to put forth his utmost effort to increase production and add to the national wealth, not only that the wastage of war may be repaired, but also that the opportunities offered by the conditions which the war produces may be taken advantage of to their fullest extent.

* * *

In the furniture manufacturing field there is abundant reason for the exercise of quiet confidence. The latest advice received from leading factories indicates clearly that the mainspring of business is gradually tightening, that plants that were obliged to curtail considerably their output for some time past are once again getting back to the normal and that a cheery optimism prevails such as would have been thought impossible not many weeks ago. At a time like this what is needed beyond all else is a readiness to meet the changed circumstances and to take advantage of a full share of the trade lost by Germany and Austria, to the advantage of Canada and Great Britain. In the light of these facts it is well to direct the attention of manufacturers to the unparalleled opportunity which lies at their very doors to pave the way for greatly increased trade. Figures covering the principal lines of the woodworking trade which were imported by Canada from Germany, Austria and other countries during the fiscal year ending March31, 1914, should amply repay the careful study of Canadian manufacturers seeking to divert trade to Canadian and British channels.

* * *

ONE of the largest Toronto piano manufacturing concerns, the Gerhard Heintzman Company, is particularly optimistic in regard to the business situation. In an appeal for general confidence the management deprecate the panic into which a number of manufacturers have been thrown. The firm is responsible for the following statement:

"When first the reports came to Canada of the deplorable conditions in Europe, there was a disposition among many Canadian business houses and many Canadians to become panicky. This, we are glad to say, has passed, as it should. Canadian banks say they are in splendid position; in fact, the best in their history, and Canada must produce, if anything, on a larger scale than ever. It will require increased production in a great many lines to look after the wants of the Motherland and her allies and we are sure the Canadian farmer and producer will not fall down.

"There is no doubt that we are up against the biggest thing in the world's history, but Canadians need not, and will not, suffer, so long as they remain coolheaded and confident. The slogan is 'Be Cheerful.' In so far as our own business is concerned, we are striving in every way to keep feeding the many mouths dependent on our factory being kept running at full time. We think we can do this by a special effort on our own part and that of our loyal representatives. We, therefore, just want to say that optimism and cheerfulness on the part of all of us will help the common cause, and pianos will be a medium of no small amount to help cheerfulness and optimism in this great and free country of ours. Let us all work along the same lines, and we are sure Canada will pass through the present period, even though it may take some months before quiet is restored across the water, and emerge more glorious and prosperous than ever."

Canadian Woodworker Essay Competition

Awards in Contest No. 1

First Prize ($20)

Mr. John W. Bailey
6 Hilda Avenue
Berlin, Ont.

Second Prize ($10)

Mr. H. W. Gould
Clinton, Ont.

SPECIAL MENTION

Mr. Albert Hudson, Hespeler, Ont.
Mr. Leonard A. Blake, 110 Millicent Street, Toronto, Ont.

The Essay Competition Awards

PRACTICAL woodworkers with ideas, and the ability to translate those ideas into plain English, made a gratifying response to our invitation to take part in Contest No. 1 (October) of the Bi-Monthly Essay Competition inaugurated by the "Canadian Woodworker."

The conditions of the competition were sufficiently elastic to embrace all branches of practical woodworking. For the purpose of encouraging originality and bringing out the best type of work, a good deal of latitude was afforded the competitor, the choice of subject, for example, being left absolutely to the discretion of each. At the same time it was understood that preference would be given to topics offering a solution of some practical problem calculated to be of general interest to the trade, or introducing something in the way of a "short cut."

The merit of the contributions sent in fulfilled the anticipations of the promoters. Individually and collectively the articles submitted bear evidence of careful thought and preparation, each competitor having a firm grasp of his subject.

The task of adjudication was rendered rather difficult, owing mainly to the high general average of the essays from the standpoint of practical merit. Marks were awarded on the value of the practice adduced so far as it afforded interest and instruction to the greatest number in the trade.

Upon this basis the first prize of $20.00 goes to **Mr. John W. Bailey, 6 Hilda Avenue, Berlin, Ont.,** for his contribution, **"Practical Knife-Making."** This article treats on a difficult subject and is the solution of a problem that is usually known only to one man in a workshop; therefore it cannot fail to be of interest to every factory in the trade, especially as a careful perusal of the essay should enable almost any machine hand in the woodworking factory to make knives for his shaper or sticker in a thoroughly competent manner.

The second place is given to the essay, **"Laying Four Veneers at One Operation,"** by **Mr. H. W. Gould, Clinton, Ont.,** who obtains the award of $10.00. This, also, is a subject which affords a "short cut" to an operation that is familiar in every factory. At the same time the subject is developed so thoroughly that every reader who has an eye to the practical side of things should gain some useful knowledge from Mr. Gould's discussion.

Among the other essays submitted we take pleasure in making Special Mention of two. One of these is entitled, **"Progress in the Cabinet Room—Production, Quality and Cost,"** contributed by **Mr. Albert Hudson, Hespeler, Ont.** The other is an article, **"Safety Belt Shifters,"** the author of which is **Mr. Leonard A. Blake, 110 Millicent Street, Toronto.** Both of these essays contain ideas and suggestions which should prove particularly interesting to every woodworker engaged in the respective departments of a woodworking establishment to which the subjects are related.

In this issue we reproduce the prize-winning essays and also the two contributions singled out for special mention. It must not be concluded that the others were lacking in merit. Many of them are well worthy of a place in our columns, and likewise of thoughtful consideration by the trade, and for this reason we purpose selecting for publication in later issues a number of the essays which, though exceptionally good in their various spheres, proved rather too limited in scope to be considered of general interest.

In congratulating the successful competitors, and in thanking all very heartily for their interest and co-operation, we direct the attention of our readers to the announcement of **Contest No. 2 (December)** made on **page 7** of this issue. Remember the closing date, **November 30.**

Practical Knife-Making

(First Prize Essay, Canadian Woodworker Competition No. 1)

By John W. Bailey, Berlin, Ont.

WOODWORKING establishments possessed of a tool room or filing room for the purpose of caring for edge tools, moulding knives, etc., being very much in the minority, it falls to the lot of the majority of machine operators not only to do their own knife grinding, but also to make such new knives as are required from time to time for regular or special work. While possibly it is questionable economy for a concern to do their own knife making it often happens, however, that time will not permit of obtaining their requirements from a knife making concern. When such is the case a practical knowledge of knife making is a valuable asset to the machine operator.

Without doubt the first step in the process of making a moulding knife is to determine the pattern. Several systems have been advocated to accomplish this by drafting, the majority of which have been too elaborate, requiring too much valuable time to work out and for all practical purposes are no better than the method used by the writer, which has the advantage of being much more economical so far as time is concerned.

Without doubt the most important part of making a knife pattern is to determine the amount of knife projection necessary to cut the different members of the mould. The balance in any event is to sketch in the intervening parts freehand.

The writer determines the required knife projection by a scale made in the following manner, which for convenience may be made in the form of a steel rule to hang on a key ring:

First, draw an outline the exact size of the cutter head used on the machine for which the knives are intended as at (a), Fig. 1 of the accompanying sketch, then lay out the projection of a straight knife past the lip of the cutter head as at (b), locate the centre of the cutter head as at (c) then draw a line from centre (c) to a few inches past the point of knife (b) as at (d). From the point of the knife (b) and at right angles to line (d) draw line (e). This line represents the cutting line for straight knives as also the initial projection of moulding knives, and is the basis of our projection calculations. So at this point on line (d) proceed to mark off with a common rule such measurements as desired for determining the corresponding projections. In this case two inches are laid off in eighths as shown at (f). Then extend the line of the knife to a distance shown at (g) and with a compass, one leg of which is set at the centre of cutter head (c). The measurements are transferred from line (d) to line (g) as at (h). The measurements on line (d)

Practical Knife-Making

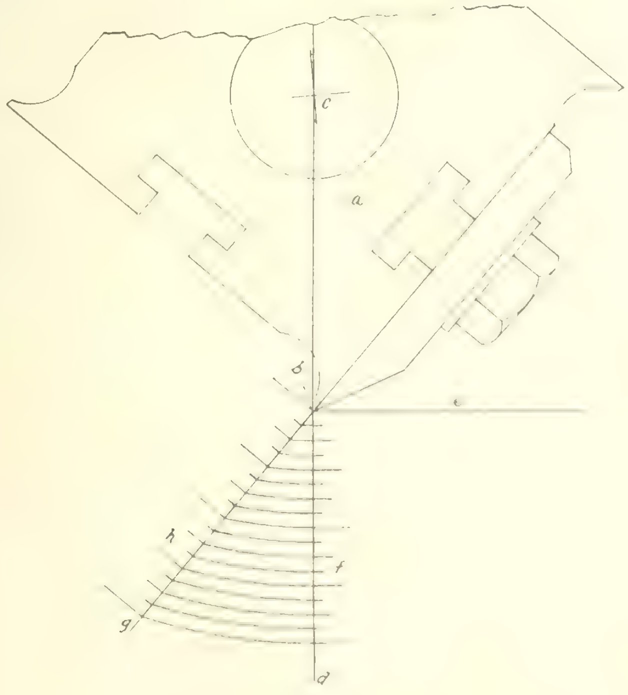


Fig. 1

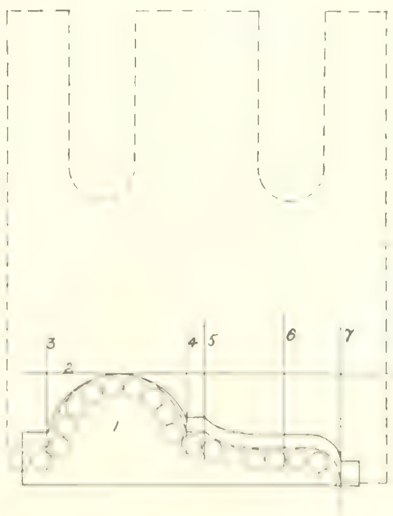


Fig. 2

represent the depth of cut and the corresponding measurements on line (g) represent the amount of knife projection required, and are what I refer to as the projection scale. While the accompanying sketches have reference to sticker knives, a projection scale for shaper knives may be made in precisely the same manner.

To make a knife pattern by the ues of the projection scale mark off an outline of the mould as at (1), Fig. 2. (The outline of the heavy mould is the heavy line). Then at the thickest part of the mould draw a line parallel to its base as at (2), then at points where projections are to be determined draw perpendicular lines as at (3), (4), (5), (6), (7). The measurements from the horizontal line (2) to the outline of the mould on the different perpendicular lines may be translated into projections by the use of the projection scale, the intervening spaces to be sketched in freehand. These are shown in dotted lines. The balance of the knife may be laid out as shown, the depth of bolt slots and length of knife over all being determined by the size of the cutter head.

The pattern having been made the next step is to "rough out" the knife. Where considerable material is to be removed the quickest method is to cut the outline of the cutting edge by drilling a series of holes as shown in Fig. 2. After this is done the knife should be carefully ground to the exact outline of the cutting edge. The knife is now ready for bevelling and as over-heating the knife while grinding makes no difference at this stage of the process, the bevel grinding may be hastened somewhat if the knife is held in a handscrew or other convenient means so that the heat from grinding will not affect the hands. At this stage the knife should not be ground to a keen edge on account of the difficulty of holding a uniform heat when tempering. (I usually leave about one thirty-secondth of an inch of an edge for finish grinding). Now comes the most vital part of the whole process—the tempering. Many an otherwise well-made moulding knife is rendered almost useless through lack of knowledge of how to temper it. When such is the case the trouble is usually attributed to poor steel. In a majority of cases, however, the contributing element to an improper temper is over-heating. This is one thing that should be carefully kept in mind. Steel should never be heated until it scales, for this decarbonizes it. Although it can be hardened still the overheating has destroyed those ingredients that make it tough, with the result that it is impossible to obtain a keen cutting edge that will stand up to the work.

The lowest heat at which the steel will harden gives the best and toughest temper. A good plan is to take a small piece of the steel used such as the offal that is cut out by drilling, heat it to a dull cherry red, and plunge it into the water or oil as the case may be. Test with a file and if found to be hard, well and good, if not heat it again, this time slightly hotter than before, being careful that the heat is uniform. Test again, but in no case should it be heated hotter than is necessary to harden it. Whether water or oil is used there should be a quantity sufficient that the heat from the knife will not materially effect its temperature. Upon entering the knife into the bath it should be kept in motion and well near the bottom of the vessel. If the knife is removed before its centre has become cold it will cause checks on the surface. After the knives have all been hardened they should be polished on the face so that the color can be readily seen. When drawing the temper one thing to be remembered here, and which has often been the cause of failure heretofore, is that the face of the knife should be free of oil or grease, as its presence tends to produce a false color. To draw the temper secure a flat piece of iron or boiler plate, somewhat larger in area than the knife, and heat it to a low red; lay the knife on this, bevel side down, keep moving it about on the plate so that the heat will affect it uniformly, and watch for the desired color to appear. The color required varies in accordance with the future requirements of the knife. If a filing temper is desired it is necessary to draw to the "pigeon blue," but for the ordinary run of furniture mouldings or mill work it is more economical to use harder knives as they hold an edge much longer and on the average will do more work between grindings than those that are soft enough to file. This applies of course to knives that have been hardened to a low heat as they possess the maximum degree of toughness.

I have met a few woodworkers who when tempering prefer to plunge the knives at a heat that will produce the desired degree of hardness without having to draw the temper any. The plunge in this case is invariably made in oil. I disapprove of the practice as it is practically a game of chance even with those of considerable experience. It is much safer to harden first, then draw the temper, and for the average run of work on stickers and shapers the most satisfactory temper results from a purplish tint. This follows a dark straw color and at its first appearance the knife should be cooled. This produces a temper too hard to file but will stand up to all kinds of hard work.

I might cite some of the most important points to be remembered, which are these: First, temper at the lowest heat at which the steel will harden. Second, do not let the plunging bath become warm. If oil is used the container should be set in a vessel of cold water to keep it cool. Third, do not immerse the knives in the bath broadside; they should enter on end and preferably heel end first as thin knives are apt to warp if the cutting edge enters first. Fourth, do not grasp the knife with tongs near the cutting edge as this retards the action of the hardening bath. There is plenty of room for a good hold near the heel. Fifth, be sure there is no oil or grease on the surface of the knife when drawing the temper, as its presence retards the color and the knife is apt to be softer than the color would indicate.

Tempering moulding knives requires judgment and precision, but if the foregoing is strictly adhered to little difficulty will be experienced in producing knives that will hold an edge and stand up to plenty of good hard work.

The G. H. Evans Lumber Company, Chattanooga, Tenn., have shown themselves to be in an enviable position in regard to lumber exports—which speaks well for future business. Recently this company was able to fill a large order for well selected walnut for use by England in making aeroplanes and gun stocks. The contract was awarded to the Chattanooga concern after the failure of a number of other companies to fill it. Several other Chattanooga manufacturers in the export business are receiving large orders for rush consignment to England. Mr. Evans, commenting on the order received from the Old Country, explains that walnut is used in areoplane and gun stock construction because it will not warp, swell or decay. Well-seasoned, it possesses great strength, and is able to meet the exacting requirements of active service.

Laying Four Veneers at One Operation

(Second Prize Essay, Canadian Woodworker Competition No. 1)

By H. W. Gould, Clinton, Ont.

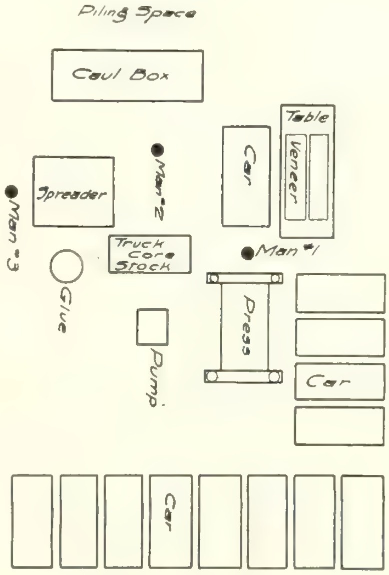
WE must take it for granted that the equipment and arrangement of the veneer room are up-to-date, viz., hydraulic press, glue spreader, proper cars and enough to handle the required work, aluminium cauls, caul box, copper glue heater, etc. The shortest cut in quickly handling a press of veneer is to have everything handy. Do not take two steps where one will do, or, better still, do not take any if it can be avoided. In short have everything within reach, and yet not in the way.

The accompanying sketch, showing lay-out for veneer room, may be of interest, especially as it will explain the following method: Where four veneers are required by all means lay them at one operation, as this method will insure against loose veneer, blisters, warping, opening of joints, checking and sink holes, so common in veneer work. Do not use core stock immediately through the planer, but rather have it piled up with strips for a few days, no matter how dry you may think the stock. Have crossbanding opened and well aired for a few days in a warm shop before using.

Face veneers must be dry, straight, and taped at the ends if likely to split when the pressure is put on, and all butt joints should have cloth—made especially for the work—glued on the under side of joint, which should also be glued whether straight-grained joint or not.

Use a granulated, non-foaming veneer glue. All glue will foam a little with the action of the rolls, but avoid air bubbles if possible as these may cause blisters. Have a spreader with corrugated, not carpet, rolls, and about 8½-in. diameter speeded to forty-five revolutions per minute. Use aluminium cauls, as they last longer, do not wear thin in places, remain straight, hold the heat well, are extremely light to handle and leave the work free and clean. Also use prepared caul veneer wax. Tallow, oils, soap and paraffin wax penetrate the veneer and cause trouble in cleaning. Prepared wax does not, besides it lasts longer on cauls. Arrange the work as per sketch, place required crossbanding on the table in front of spreader, concave or curled side up, place face veneer face down on table opposite car, also backing veneer, have core stock on truck and rack at one end of caul box to receive one end of cauls standing on edge and about seven-eighths inches apart. Do not let cauls touch pipes at any point. Place required number of cauls in caul box. A batch of twenty-five pieces makes a fair-sized press full of large stock, and will require twenty-six cauls. Do not let cauls become too hot, as much damage may be done to the glue. Yet it should be warm enough to keep the glue soft until the last piece is in the press. Do not let the glue in the heater register over 160 degrees. 150 is enough, and in the spreader, 140.

Process—Run car out of press opposite spreader and proceed to lay as follows: Man No. 2 takes caul from caul box and lays it on bottom of car; man or boy No. 3 feeds in crossbanding with rolls set to pull in veneer and glue both sides at once; man No 1 places face veneer face down on warm caul on car; No. 2 catches crossbanding from spreader and lays it without turning it over on face veneer on car. No. 1 places core stock, best side down, on crossbanding on car; No. 3 feed in another sheet of crossbanding; No. 2 places it also without turning it over on core stock on car; No. 1 places backing veneer on crossbanding on car; No. 2 places another warm caul; No. 3 proceeds as before and so on until the car is loaded. The car is then pulled, not pushed, into press with long-handled hooks, catching them in eye of car. Sufficient packing is then placed on the car and also on the upper platform. Pressure is then applied and the retaining rods put on. These rods should have a large-sized thread on end so they will act quickly and wheel with square hole in centre to tighten the nut. The pressure should be about 1,800 lbs. to the square inch. After the rods are secured the pressure is released and the car run out. This operation should take from ten to twelve minutes only and the car should not be opened within periods varying from eight to twenty-four hours. Oak will lift in eight hours but figured walnut or mahogany should be left in until the following day. When the retaining rods have been taken off and the stock removed, place stock on trucks, run to drying room and have it piled up with three strips ⅞ x ⅞, as long as the stock is wide between each board and these are kept in perfect alignment on level foundation. Do not allow these piles to be taken down in less than three weeks if you would insure a first-class job except in case you have to make room for other work. Then after two or three days they may be edged and sized and lightly put through three-drum sander to remove any wax and glaze from aluminium cauls. Do not, however, cut down the veneer and then pile them up with strips in the cabinet-room for at least two weeks as before.



Lay-out for veneer room.

This drying is necessary to insure against after-warping and sink holes. By laying four veneers at one operation you save time, retain all the strength of the crossbanding and also save glue. Keep spreader scrupulously clean by washing with h[illegible] every night. Keep all glue cleaned up once a day and always use freshly heated glue as it pays in veneering never to take unnecessary chances.

A Discussion of Safety Belt Shifters

(Awarded Special Mention, Canadian Woodworker Essay Competition No. 1)

By Leonard A Blake, Toronto.

IN a recent article on the principle of "safety first" as applied to the woodworking industry, the writer mentioned the danger of a loose pulley seizing on the shaft and so starting the machine, while the operator's hands were in the danger zone. A similar danger, which is perhaps more often encountered, though it occurs at equally unexpected times, is met with by reason of the liability of the belt to take a lead and run on to the fast pulley, pushing over the shifter at the same time.

With a new belt and properly aligned pulleys and shafting, it is reasonable to expect the belt to track over the pulley without requiring the shifter to be fixed to keep it in place, but the side strain through constant changing, especially on a stepped loose pulley, will soon get the belt out of shape and cause it to lead. Unfortunately for many this lead often develops unnoticed and does not manifest itself until someone's fingers are holding the cutters in close quarters.

The present writer once had a "close shave" in this way when setting up a sticker. With both hands on the top head in the act of screwing down a knife the machine started, and although the hands were withdrawn in time the knife flew out. By good luck the knife disappeared without leaving tracks on any person or anything, but here were the possibilities of two accidents. Had the operator's fingers been under the head they would have been smashed and what would have happened to anyone in line of the flying knife would no doubt have been "a-plenty." The next job on hand then was to fix the shifter so that it would stay in position, as illustrated in Fig. 1.

The main part of the shifter had always been swung from the joist above with a fixed handle about the same place as the new one was put on. The tool box had been mounted on the machine shortly before the belt began to lead and afforded an easy fixing for the catch.

On a heavier sticker of rather different build the shifter was made to slide on a frame fixed to the floor, as in Fig. 2. To move it it is always necessary to lift the handle to get the slot to lead over the bolt in the frame. Owing to the weight of the rig it will not mount the bolt by plain end thrust, so there is no danger of the belt getting over by itself.

For overhead rigs for planers or rip saws driven from above, refer to Figs. 3 and 4. These do not require more explanation than to say that the handle has to be pushed up before the belt can be shifted. The arrangement is shown plainly by the sketches.

In Fig. 5 is shown a simple safety rig for machines driven from below the floor. All that is necessary is to see that the handle has some spring, then to fix a block either on a special frame or an existing post or even on the machine itself, so that in either position the handle cannot be moved without being pulled out to clear the block.

Another rig that is, no doubt, so unusual as to be eligible for the freak class, is the subject of Fig. 6. Here, the machine was a push table cross cut, arranged to cut off stock after ripping without turning. This necessitated a quarter twist belt somewhere, and instead of being on one of the lower drives it was put in on the drive between countershaft and saw arbor. Thus the countershaft under the floor ran directly under the saw and parallel to its plane of revolution. The shifter was brought up at back of machine and a handle fixed so that it would be movable from the

A Discussion of Safety Belt Shifters

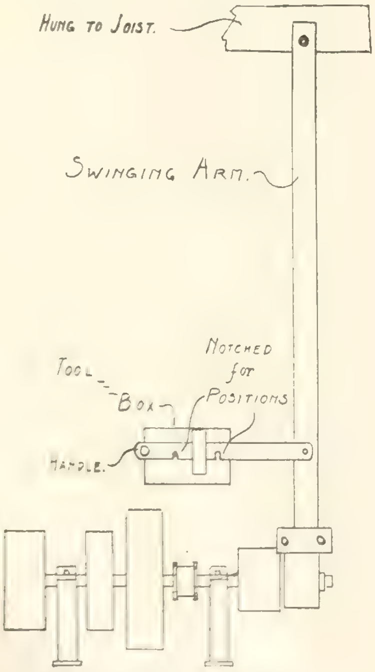


Fig. 1—For small sticker.

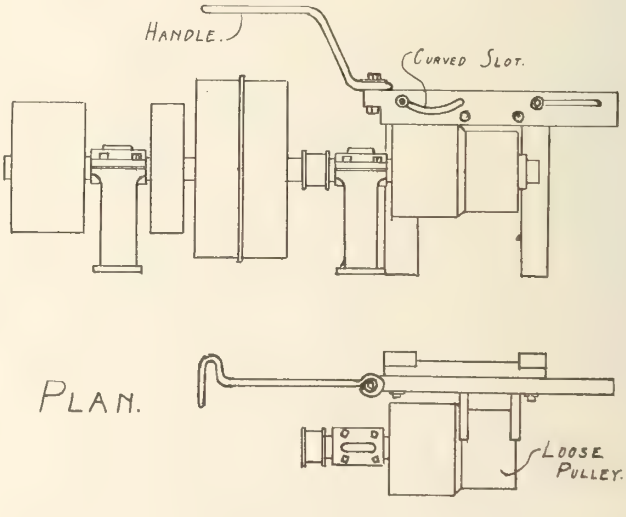


Fig. 2—Shifter for heavy sticker.

operator's normal position at the machine. The safety provision was observed by having a notched stick projecting from one of the building posts to catch the extended tail end of the handle.

For a sticker drive belt coming up through the floor a foot-operated shifter is handy as shown in Fig. 7. A slight forward pressure clears the notch, and the spring keeps the notch on the pin when this pressure is removed.

Up-to-date shapers are provided with pedal shifters, but some older makes are without these conveniences, necessitating another foot-operated rig on the floor, as in Fig. 8, which shows a shifter arranged for a shaper driven from below. Should the drive be from above, the shifter bar would have to be mounted on a frame and connected to the long lever, but the safety provision would be the same; i.e., a notched bar right over the foot lever engaging a pin on the lever. The downward pressure of the foot releases the pin at once and the spring of the wood keeps the pin up in the notch when left.

The commencement of this article referred to the importance of keeping the belt on the loose pulley, but it will be noticed that in each rig mentioned pro-

Safety Belt Shifters

(Leonard A. Blake)

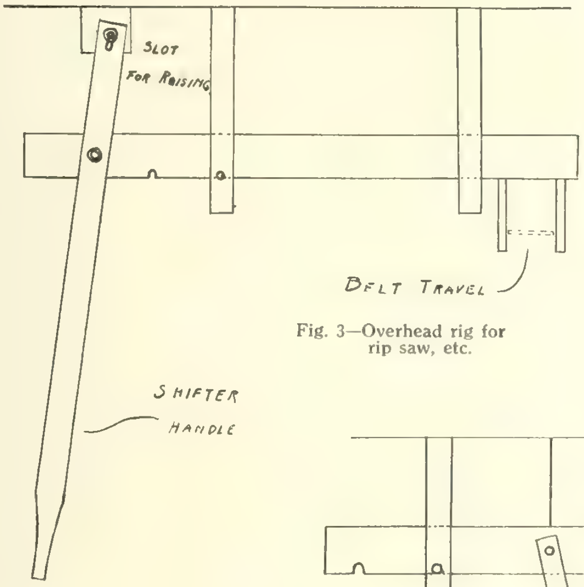


Fig. 3—Overhead rig for rip saw, etc.

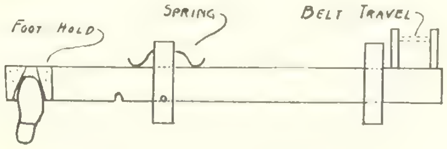


Fig. 7—For sticker driven from below.

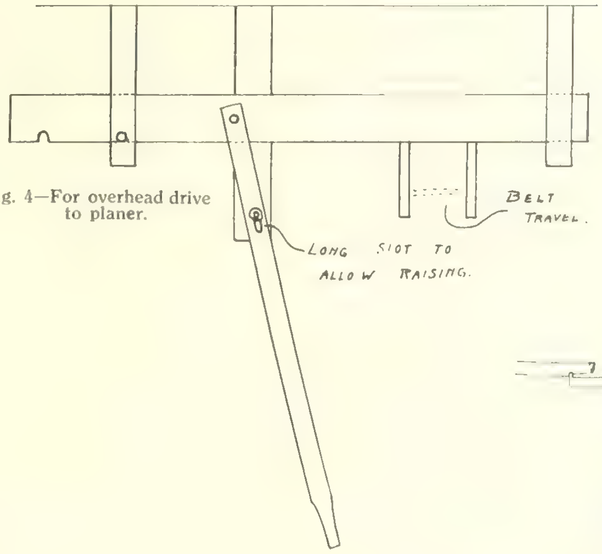


Fig. 4—For overhead drive to planer.

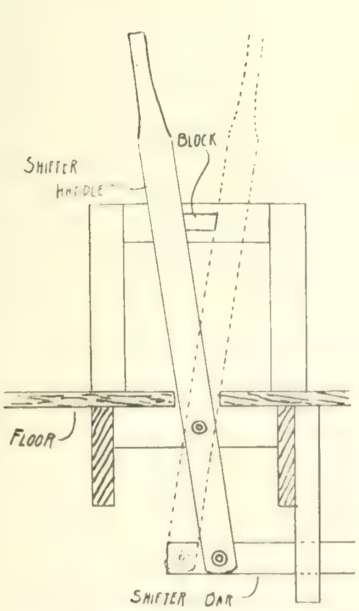


Fig. 5—For drives from below floor.

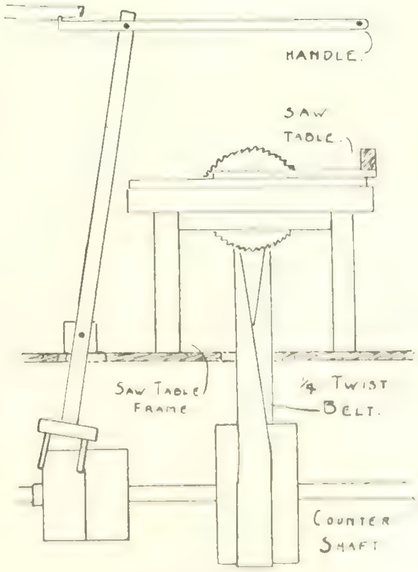


Fig. 6—For cut-off saw.

vision has also been made to keep the belt on the tight pulley when placed there. It may be remarked that it is not every belt that leads from the loose pulley to the tight. Some do just the opposite, and although not so dangerous they are apt to lower the production, which means loss just the same as an accident. But still, "Safety" must be "First" these days, hence the reason for treating on the lead from loose pulley to tight in the first place.

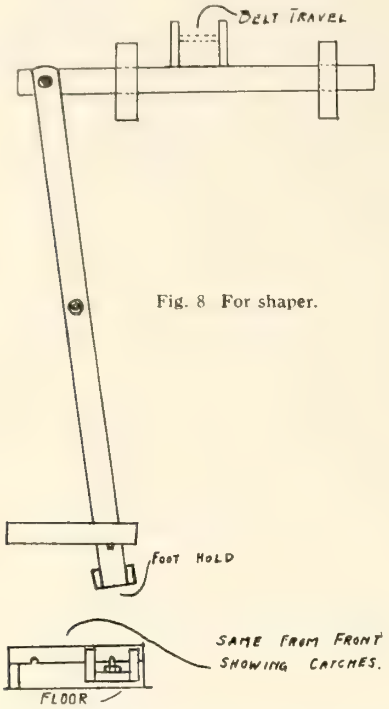


Fig. 8 For shaper.

Matching Metal Trimmings to Woodwork

HARMONY makes it often necessary for the metal ornaments on woodwork and furniture to be of a color differing materially from that found in staple products of trade. Most common finishes desired are old brass, gold, silver, iron color, old iron color, dull gold, bright brass and steel blue. For these no special equipment is needed, and only processes are given that need no galvanic current; fundamental conditions for production of the tones are practically the same as for wooden finishes. Metal surfaces must be clean, otherwise the tone will be spotted. Stock metal parts are coated with protective lacquer after coloring to prevent oxidation, and this coating must be dissolved before applying new finish. Before coloring, the metal parts must also be given a smooth surface to abrasives—as medium coarse emery paper—brushing with a brass wire bristle brush and pumice stone flour, or by dipping the pieces in a solution which will give the pieces a uniform grain. Pieces, while still wet and free from oil or grease, are then brought into coloring solutions.

Simplest of these is old brass. To a solution of one liter hydrochloric acid add ten grams of arsenious acid and ten grams of green vitriol or ferrous sulphate. After complete solution add one-tenth liter iron chloride and one liter water. The entire mixture is vigorously shaken, and is then ready for use. This composition is used for old brass, old silver, iron and old iron colors.

Old brass metal pieces, after cleaning, are put into the above solution. Touching the metal parts with a narrow strip of zinc covers them with a steel grey to dark grey coating. After removing pieces from the liquid they are rinsed in water and then a coarse bristle brush or a fine brass brush with powdered pumice stone is used to make the coating uniform, so the brass just about shows through. The process is repeated till the desired tone is reached, when the pieces are washed in fresh water and dried in soft sawdust.

For iron the same process as above is used, only that the grey colored pieces are not rubbed with pumice, but with a rough brush in one direction, giving a steel grey tone, whereas pieces when first leaving bath are dull.

For dull gold the following solution is needed: One hundred grams of potassium bichromate is dissolved in one litre of water, and two ounces pure sulphuric acid added. After the finely powdered bichromate is dissolved, liquid is ready for use. Brass pieces are left a few minutes in the solution, taking on a beautiful dull gold color similar to real gilding. Pieces are then drawn through a 10 per cent. sulphuric acid solution and washed in clean water and dried in sawdust.

Old silver metal pieces are dipped in the first solution mentioned, receive a grey finish, and are then washed and coated with some silver paste. The grey deposit disappears in part and mixes with a silver tone. The pieces are then washed and dried.

To get steel grey: These shades can be obtained by dipping metal objects in an almost boiling solution made up of 500 grams water in which 15 grams sugar of lead—lead acetate—are dissolved. In a sepatate flask dissolve 45 grams sodium hyposulphite—hypo—in 250 grams of water. Both solutions are poured together and heated to boiling. Brass colors in this hot mixture as follows: First, brownish, reddish violet, steel blue, finally light blue. Any of these colors can be retained by taking work out of the bath, washing and drying in sawdust. Metal pieces, after coloring, must be coated with a lacquer for protection against oxidation.—L. K. Hirshberg, in the Furniture Manufacturer and Artisan.

The Board of Trade of London, England, regard the present as a most favorable opportunity of establishing new and permanent connections with home manufacturers and overseas importers of furniture and they are making a special appeal to Canadian firms to place whatever orders they may have with the Old Country. It is pointed out that the manufacturers over there are in a position to execute expeditiously all orders which hitherto have been given to other countries. The Board of Trade has a Commercial Intelligence Department at Basinghall Street, London, E.C., to which all enquiries should be addressed.

A preservative adopted for the timber used in some Belgian collieries, is called "Axol," and consists of a solution of copper and zinc in ammonia, with the addition of a certain amount of benzol. The wood being placed in a boiler, is first submitted to a vacuum for twenty minutes. The liquid is then applied, and is forced into the pores of the wood at a pressure of ten atmospheres for twenty minutes. The material so treated is claimed to be unaffected by dampness or heat, while it has no smell and is free from any smearing outside surface.

Progress in the Cabinet Room — Production, Quality and Cost

(Awarded Special Mention, Canadian Woodworker Essay Competition No. 1)

By Albert Hudson, Hespeler, Ont.

THERE are three essentials that a cabinet-maker must not overlook in his work to assure success, namely, Production, Quality and Cost. There are certain characteristics that a cabinet-maker should study in order to add to his value as a mechanic. Every mechanic should realize his value and the important part he plays in making the department in which he works a success from every standpoint. If this is done the business of the factory is sure to be a success. For work to come right, it must be started right, remembering that "well begun is half done."

There are some workmen to-day who seem to think of nothing else but "How much am I going to get for this article?" or "How much am I going to get an hour?" or "When am I going to get a raise?"

I have known men to say, "I will do so much work a day and no more; when I get a raise I will do more work," knowing full well that they were not producing according to their ability. I have known men say when questioned about the quality of their work: "Well, that is as good as I am paid for, when I get more pay I will turn out better work." I had men of this type to deal with when foreman of the cabinet room of a certain furniture factory. Workmen of this class stand in their own way of success and advancement. I found that these men were of little value to the factory. They are continually fault-finding, often causing discord among the workmen, a source of worry to the foreman, and drones upon the factory. In my opinion there is only one thing to do with such men—and that is to pay them off.

Then there are men who have an insufficiency of tools and sometimes have to run around to borrow certain tools, thereby causing a break and delay in their work which nine times out of ten cannot be caught up again. This can be avoided easily by the mechanic himself getting a full supply of tools and keeping them in the very best of condition, thereby ensuring no waste of time, and good work.

Happily all cabinet-makers are not alike. I have known some who have rectified mistakes and never complained, and then brought out their work in a reasonable time, and some who have never complained even when there has been just cause for complaint, but instead have gone on working faithfully. This is not always the best course to take. There are times when complaints to the foreman are wise, and the wrong can be righted with very little trouble. One day a cabinet-maker called my attention to a slight mistake on a certain class of work, saying, "I believe there has been a mistake made here." After looking into the matter I found that for the man to make right the wrong it would cost twice as much to rectify. Needless to say I sent the work back to the machine room.

I know a cabinet-maker who went into a factory at 18½ cents an hour. To-day in the same factory he is receiving 30 cents an hour. His motto is, "If a thing is worth doing it is worth doing well. Do your best for the firm and all will go well." These are the workmen who eventually succeed, always studying the firm's interest as well as their own.

Workmen should try in every way to give of their best, and their efforts will be rewarded at a time when they least expect it. A cabinet-maker should be able to cost up a job and know how long it should take to produce. This is accomplished only by training oneself to it, and by constant practice.

A cabinet-maker should have a system of working and always look out for a better way. The habit of getting a job under way on the usual method is not enough. The very time one thinks that everything is coming his way and that there is no need to bother or "get a move on" is the time that things stop coming.

Success has its price. Ability is the only thing that can buy it. I have seen cabinet-makers working hard all day but accomplishing practically nothing. These men had been giving of their best, but lacked the necessary training, thereby working to disadvantage. I have spoken with these men and have persuaded them to work by different methods, with the result that a change came about and in a very short time their efforts were rewarded with an increase in wages.

A cabinet-maker should cultivate the art of adaptation. Nine times out of ten it is not because men do not work hard that the output and efficiency are poor, but because their efforts are misdirected along one line or another, or because working conditions perhaps are not what they should be.

Cabinet-makers would do well to make themselves efficient, as that is the only means to a profitable end. Workmen should remember that their employers do not decide whether they shall stand still or advance; that rests entirely with the workman himself. The workman himself chooses success or failure. A cabinet-maker should be able to read drafts and do a little detail drafting. This is not essential or necessary, but it gives him a much better standing if he can do so. I have taken drafts to men who could not read them and who were constantly calling me away to explain things to them. On the other hand I have taken drafts to men who could read them and therefore saved me unnecessary trouble. It would be much better for workmen if they studied the details of their calling more and showed at all times a willingness to learn. I have been leading men for a number of years and am still receiving pointers.

Workmen should also remember that when hard times come and the staff is reduced for some cause, the poorest man goes first, and the best man is kept. Why not be the best man? A first-class cabinet maker can demand the highest rate of pay and get it. But he can only do so by studying his calling thoroughly along the lines of Production, Cost, and Quality.

The foreman of the Cabinet Room should be a man who thoroughly understands his work. He should be resourceful and well-balanced, having the ability to see things. His knowledge of the affairs of his department should be thorough. He should be a leader in every sense of the word, gaining the respect of the workmen, but showing no favor towards anyone. Some foremen will try to win the respect of their workmen by granting special favors. This, to my mind, is a mistake. Methods of this character should not be tolerated, as the foreman who grants special favors to gain respect is sure to meet disaster in the end.

A foreman should cultivate the art of acquiring the respect of his men. In my opinion this characteristic is one of the best with which a foreman can be endowed, along with his practical knowledge.

For a foreman to gain the respect and admiration of his men seems to me to be half the battle. Working together in unity—the cabinet-maker in his sphere and the foreman in his, what can hinder the success of the department? He should also study the individual ability of his men and endeavor to arrange his work accordingly, so that every man would get the work to which he is most adapted, thereby assuring Quantity, Quality, and Economy.

A resourceful and well-balanced foreman will not look for perfection in his men, nor will he become irritated at its absence. He merely sees that which is there and no more, and then sets to work and draws it out.

A foreman should see to it that his department is kept in the very best of condition, free from litter and clean, so that working conditions are of the very best. He should see to it that his department is run systematically, so that there is little difficulty in turning out the work to the best advantage.

There are problems that every foreman has to face, but he should remember that the more difficult the problem to solve, the greater the victory when the solution has been accomplished. The same three essentials are just as binding on the foreman as the man at the bench—Production, Quality, and Cost.

Cement In Lumber Dry-Kilns

Concrete Provides Efficient Insulation Against Radiation or Other Heat Losses, as Well as Against Entrance of Moisture

By G. D. Crain, Jr.

WHEREVER tightness against both moisture and air is desired, the use of concrete has become practically a foregone conclusion in recent years. Conspicuous examples in proof of this are found in the use of reinforced concrete for the construction of grain bins and elevators and other such necessarily moisture-proof structures.

A somewhat inconspicuous, but nevertheless important, illustration of the same valuable properties of concrete is found in the use made of it in constructing the dry-kilns now generally employed in all of the larger establishments that must use lumber in their operations. These kilns, the purpose of which is to remove by artificial means the moisture from green lumber, should, of course, be perfectly tight, in order to secure the best results; and experience has shown designers of such structures, and wood users generally, that the liberal use of concrete is the best way to do this.

A dry-kiln built for a Louisville wagon manufacturing concern in 1906 is as interesting a piece of work as can be found. Its relatively long period of use is also of interest as demonstrating the efficiency and durability of the kiln.

This wagon company uses large quantities of lumber, principally oak and hickory; and inasmuch as it is highly desirable, if not essential, to keep the plan in practically uniform operation as much of the time as possible, a large and efficient dry-kiln was needed to make certain that there would always be on hand an ample supply of well-cured material. In certain seasons the natural supply of air-dried material is frequently very short; and as it takes about four years for a 4 by 4 stick of hardwood to season in the yard, the advantage of an efficient dry-kiln is obvious as a means of hastening operations.

The requirements of a dry-kiln being as indicated, the use of a material which would prevent the radiation or other loss of the heat introduced was obviously necessary; and for this purpose the contractor hit upon concrete in conjunction with hollow fireproof tile—a combination that eliminates the otherwise almost constant danger of fire in such structures.

A rather odd situation controlled the design of this dry-kiln as to the method of drying, which provides for the use of two distinct processes—one as steam radiation system, as used in the "Andrews" type of condenser kilns; and the other, a hot-air blast, this being known among lumbermen as the "common-sense" kiln. The company had not fully satisfied itself as to which method was most efficient, and therefore decided to make arrangements to use both.

The building measures 101 ft. long by 91 ft. 6 in. wide; and in order to enable the two systems to be used side by side, the yard track carrying the cars of lumber into the kiln was run between two separate sections, one of which contained the blast system, and the other the steam radiation system. The former consists of a series of six chambers of about equal width, but of only half the depth of a similar series on the other side, in which the steam is used.

In order to prevent moisture creeping in from below, or heat escaping in that direction, concrete floors are used throughout the building, a slab about 5 in. thick, with a 1-in. top coat, being used.

The two systems calling for different systems of placing the lumber, the construction plans of the two sides were also necessarily different. The most conspicuous difference, perhaps, lies in the height of the floors themselves. The tracks in the several chambers are necessarily higher than the track entering the building, the method of handling the lumber being to bring in a loaded truck from the yard, set sidewise on another truck, so that it can be rolled off onto the track in the chamber in which the lumber is to be dried. No turntable is necessary, the tracks in the drying chambers running at right angles to the track entering the building.

In the hot-blast side, the hot air being forced through the several chambers by a fan and suction system, which carries the air through at one side and back by the other, it is not desirable for the lumber to be much elevated; and the floor is therefore raised to the level at which the car must enter these chambers from the track from the yard. The concrete floor in this side of the building, therefore, rests upon a fill of cinders, which brings it up to the proper level.

On the other side of the building, however, the heat which effects the drying comes from 1-in. pipes running along the floor, and the lumber must be elevated above these. The floor proper, therefore, is flush with the floor on which the entering track runs, the tracks in the chambers on this side being supported on steel standards 3½ inches in diameter, which in turn are bolted to concrete piers. The tracks on the other side rest on dwarf concrete walls 12 inches thick.

The walls dividing the several drying chambers are composed of 8-in. hollow tile, coated on each side with an inch thickness of a cement mixture. The roof is a rather curious, but wholly effective affair, made up of several distinct layers of different materials, the rising tendency of heated air making it especially necessary to provide against loss of heat at the top of the building.

Immediately above each chamber, constituting the inside ceiling finish, is a 2-in. thickness of a concrete mixture, applied as if it were plaster. The 4-in. thickness above this, constituting the roof structure proper, is of the ordinary floor-plan used in many buildings, consisting of a series of ribs or beams, the spaces between these being filled with hollow tile. These beams run at right angles to the walls, and derive part of their support from them.

On top of this roof-slab of concrete and tile, a thick layer of cinders is used, ranging from about 6 in. at the edge to twice that, according to the pitch of the roof. This in turn is covered with composition roofing, making a quadruplicate roof which has proved very efficient in keeping the heat in the building.

Patented doors and door-hangers are used at the entrances of the building, as well as to the several chambers, set in concrete frames to prevent the outside temperature from affecting the drying process. The careful separation of the drying chambers from the passage on which the entering track runs is particularly necessary, in view of the fact that this passage is lighted from above by means of skylights, and it is difficult so to adjust ordinary skylights so as to make them air-tight. In this case, accordingly, the lights rest on concrete frames.

Heat for the hot-blast sections, and steam for the other side of the drying plant, are furnished by the power plant of the company, which is only about 100 feet distant. Both are conveyed overhead by means of asbestos-covered pipes. Exhaust steam is used during the day, live steam being provided at night when there is any lumber drying.

The dry-kiln has proved completely satisfactory to the company, handling very efficiently all of the lumber which has to be dried; and, it may be remarked, the company has not yet fully decided which drying system it prefers.

The present abnormal circumstances will open up a great many new avenues of sale for various commodities, among them being lumber and veneers. Already it is stated that one southern concern has sold a considerable quantity of wide poplar boards for British mess tables. Poplar, of course, is very well suited for this purpose and if properly treated should stand up well as far as warping ,twisting and splitting are concerned. However, it would seem that well-built panels made up with waterproof glue would give even greater assurance of permanence of form. It would seem that the game would be worth the effort.

The Tendency in Furniture Effects

THE day of the "loud" figure in furniture is believed by many who have followed the trend of the business to have passed, declares the Furniture Manufacturer & Artisan. At one time the furniture manufacturer required his material to have striking effects as to figure. The larger the figure and the moer spectacular its appearance, the better it was liked. In recent years, however, the public has turned away from these extreme figures, probably for the same reason that it has shown a disposition to use wall paper designs which are quiet rather than violent—the latter are not so easy to live with. Thus one sees quartered oak and mahogany being purchased from the manufacturers with the proviso that the figure shall be small in order that the finished piece may look rich without being garish and elegant without the suggestion of loudness.

Black walnut is coming into general use. It lends itself particularly well to this trend, as this is a wood which is of obvious quality and beauty, yet with a figure which is not at all extreme, and which gives an air of quiet and aristocractic richness rather than appealing on account of a splashy figure or unusual markings. Manufacturers of furniture who are serving the trade which demands quiet though rich effects, are likely to be particularly impressed with the desirability of walnut from this standpoint.

Cabinet-Making Woods of Australia

Australian woods are admitted to be of singular beauty and admirably fitted for cabinetmaking and such purposes. A splendid example of their suitability for artistic cabinetwork is shown in a writing table, to be presented by the Commonwealth to the Peace Palace at the Hague, now on view at the Federal Parliament House, Melbourne. The table is made entirely of magnificent examples of Australian ornamental woods, comprising blackwood and silk oak from Victoria, jarrah from Western Australia, blue gum from Tasmania, cedar from New South Wales, and beech from Queensland.

Of special interest are the inlays of red gum (now quite black) which are made out of some sections of a very old corduroy road found during some recent excavations in Melbourne. The inlays generally are of satin box and red gum, with squares of Queensland opal, mother-of-pearl, turquoise and pure gold. Some very rich pieces of musk and wild olive have been used as insets in the panelling. A carved band around the table has a distinct Australian significance, comprising a band of gum leaves, with wattle, and containing the local flora and foilage of the different states. Some of the small marsupials indigenous only to Australia are shown, life size, also in the carving. The handles, which are in Broken Hill silver, represent Australian animals, richly modelled and chased. An inkstand which is to accompany the table is formed of gold, silver and colored enamels. The various states are surrounded by richly chased bands repres[illegible] leaves. Between the inkwells is a gold representation of the Australian coat of arms, with the shield in enamel.

Efficiency in the Sanding Room

The Third of a Series of Articles Relating to Economic Sanding Room Practice. Herein the Author Treats with Machine Location and Operation and Offers Suggestions of Practical Interest to Sanding Machine Operators and Sanding Room Foremen

Specially contributed by H. H. Allen

SANDING machinery should be arranged with a view of facilitating the work in every way. The sanding room should be well lighted with machines arranged so that operators have plenty of "elbow" room, and ample space should be provided for trucking all around the machines and in the aisles. A wrong idea, and one that makes for unnecessary sanding expense, is to locate the sanding room in any old part of the plant and arrange the machines congestedly or haphazardly. The sanding room should occupy a position so that the natural progress of stock through the factory will pass through it and into the finishing room. Say, for instance, stock to be sanded comes from other machine departments, from the surfacer's or the glue room. In the most convenient and natural manner possible the stock should come into the sanding room, go through the necessary operations and pass on into the finishing room without the necessity of its making a detour.

Economical Transportation

It has been my experience that not enough attention is paid to routing stock through the factory so that each operation will bear an economical transportation relation to all the other operations. In one plant I recently visited, I found an arrangement that certainly didn't work out for economy. The sanding room was located in an out-of-the-way part of the building. Stock had to be trucked a considerable distance to and fro. This extra trucking represented an unnecessary expense, and, besides, the machines were carelessly arranged, handicapping the progress of the work through the department. I suggested to the superintendent that the sanding was costing at least 20 per cent. more than it should. Such instances are in no way exceptional.

A prominent door concern, after years of endeavor toward general efficiency in every branch of their business, cut down their sanding expense 50 per cent. by sanding their doors on six-drum roll feed sanders arranged tandem. Before they took up this arrangement three-drum sanders were employed, and to obtain the desired finish each side of the doors was sanded twice through, using very fine paper the last time through. Thus each door was passed through the sander four times before it was pronounced finished.

Now only two workmen are employed on the tandem arrangement, and once through "does the trick." The first unit carries reasonably coarse paper on both top and bottom drums; the second unit does nothing but polish, with No. 0 and No. 00 on all drums.

In sanding such stock as table tops or doors it is good practice to feed the stock through the machine diagonally. This allows the drums to cut on an angle across the grain of the wood, which is an advantage, and permits each succeeding piece to be started into the machine before the immediately preceding piece has passed the infeeding rolls. The accompanying sketch gives a clearer idea of this. Where stock is fed squarely through the sander, no matter how closely it is kept butted, there is always a momentary halting action of the rolls as the preceding piece leaves the rolls and the succeeding piece responds to the feeding action. This is a frequent cause of "snipped" or rounded over edges, which on veneered stock may easily cause expensive damage by extending clear through the veneer. Feeding stock, as shown in the sketch, eliminates all possibility of this.

On either roll feed or endless bed sanding machines the grade of paper must be adapted to the finish desired. Always use grades as coarse as possible, as the finer grades soon lose their cutting surface. Never use fine grades such as No. 00 and attempt to take a heavy cut or feed fast. Use a coarse paper on the first drum and adjust the drum so that it removes the necessary cut. The second drum should carry finer paper and merely work to remove the scratches of the first drum. The third drum should run 300 revolutions faster than the other two and should carry a very fine grade of paper. Always remember that the third drum should do nothing but polish. A practical speed for all 11 or 12-inch drums is 1,000 to 1,200 revolutions per minute for the first two drums, and 1,500 for the polishing drum.

To do good work the paper should be tight on the drums, and as it stretches the slack should be taken up. If it isn't, the paper is likely to catch and tear loose and cause injury to the felt or canvas with which the metal surface of the drums is covered. Some makes of drums are provided with an automatic paper take-up, which works out advantageously.

Causes of Poor Sanding

Poor sanding is frequently caused by a drum out of balance, and until the cause is remedied there is no use to try and get good work from the machine. The entire sanded surface will present an appearance full of marks greatly resembling knife marks on a planer. Drums of the straight-opening type are especially likely to become unbalanced as dust works in through the opening in sufficient quantities to throw the drum out of balance. This accumulation may be knocked loose with a stiff wire, or blown out with compressed air. Frequently, in sanding oak these same marks made their appearance, which is not due to out-of-balance drums but to too fast feeding.

Never install a drum sanding machine on an old, shaky floor. Vibration is sure to result, which will not only affect the quality of the work but will shorten the life of the machine. If it is necessary to install a sander under such conditions, at least support the floor directly beneath the machine with heavy timbers.

Adjust the feed of the machine to the class of finish desired. On parts that require sanding on both sides, with one side exposed—which will necessarily require a finer finish than the unexposed side—employ two separate machines rather than one if possible. Sand the unexposed side on the first machine, using coarse paper and feeding fast, and sand the exposed side on the second machine, feeding sufficiently slow to obtain the desired finish, using finer paper than on the first machine. This is a much more economical method than using only one machine, which would necessarily require sanding both sides at slower feeds or setting over to complete the job. Where only one machine is available, though, set up first for the unexposed surface and then change to finer paper and sand the exposed surface.

How To Prevent Expensive Sanding

Inaccurate surfacing or careless glueing is frequently a cause of expensive sanding. Stock is delivered to the sander in varying thicknesses, and to correct the inaccuracy the sander is required to take heavier cuts than it should. This handicaps production and needlessly adds to paper expense, as the paper will require changing much oftener than where the sander is used as a polishing machine and not as an equalizer. Consideration should be shown the sander in surfacing or otherwise preparing stock to be sanded. See that surfacing is accurate. Then the sander will be required to take only a light cut and will consequently stand faster feeding. This makes for bigger production and lower sanding expense. The practice of permitting the surfacer operation to turn out stock in any old kind of condition, simply because it is to be sanded, should be discouraged.

On the belt sanders, which are built in any number of styles, it is difficult to lay down any hard and fast rules. In many instances the belt machine performs the initial sanding operation, but largely it is used to give final touches to stock sanded on the drum machine, and to sand curved and odd-shaped pieces the drum machines will not handle. As I said before, the belt sanding machines are representative of the most expensive methods of sanding, as the quality of the work depends absolutely on the ability of the operator. Each piece is handled separately. Because of its higher ratio of expense the belt machine should be used only where conditions would seem especially to warrant it.

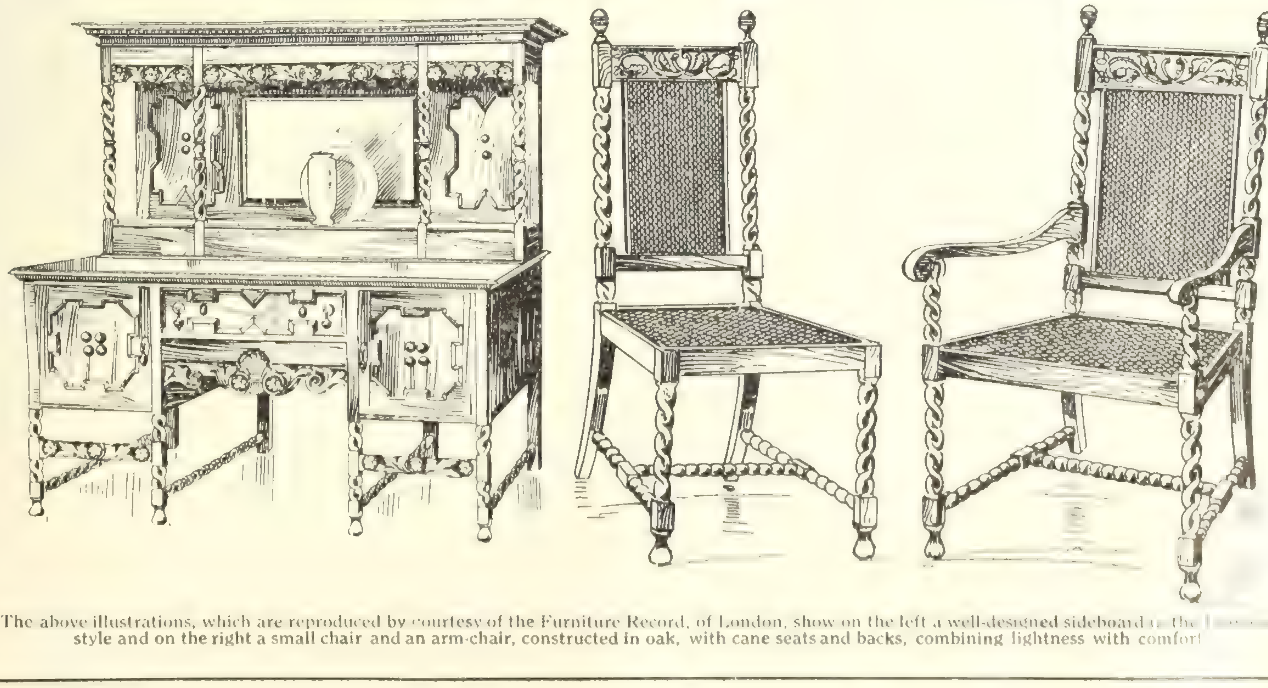
Those who want to know positively when lumber is dry, and what percentage of moisture is contained in their lumber stock, can now provide themselves with special appliances to help determine this matter positively.

An Opening for Whitewood Furniture

The favor that is shown to some white and tinted enamel finishes should make an opening for the developing of new ideas and new products in whitewood furniture, both solid and veneered. Maple is already well known and quite fairly appreciated in this work, but their are some other woods susceptible of good finish that have been scarcely noticed, among them being white gum. White gum carefully finished makes an excellent product, and there is what is known as a black gum, the bulk of the tree being of a creamy white color, that has enough interlocking grain and curly nature to make a beautiful face. Perhaps the one great handicap in the way of it is the difficulty of finishing it off. One of the manufacturers of some of the finest furniture in the country, who has experimented with this gum, says that the only thing that has held him back from using it quite freely is that it is somewhat difficult to finish off. It can be finished by scraping, however, and there are modern scraping machines which should make this work comparatively easy. Properly finished, this gum should give us a beautiful creamy product in its natural color, and, when not desired in this form, may be stained to almost any color desired, because it takes stain beautifully and polishes off like mahogany.

Glue has always been an important item in the wood-working industry, and the importance and magnitude of its use is increased right along with the more extensive application of veseers in wood work.

According to recent tests made by the Australian government, that country claims the strongest wood in existence—yate. According to announcement of tests, the average tensile strength is 24,000 pounds to the square inch, equalling that of cast iron. One specimen was tested up to seventeen and a half tons to the square inch, which is equal to the tensile strength of wrought iron. It is stated that the tree grows to a height of 100 feet and sometimes two and a-half feet in diameter.



The above illustrations, which are reproduced by courtesy of the Furniture Record, of London, show on the left a well-designed sideboard in the [illegible] style and on the right a small chair and an arm-chair, constructed in oak, with cane seats and backs, combining lightness with comfort

How To Obtain The Best Saw-Mill Results

A Discussion of the Main Factors Which Make for Satisfactory Results—The Practical Utility of Paper Friction Drives

A hardwood millman who has a mixture of logs in his available timber supply, including oak, poplar, gum and some pine, says that he has about concluded to confine his operations for the time being to oak and poplar and to strive for the best in these.

The explanation given for this involves a question in log sorting. He says that most of his gum is sap gum and runs largely to common stock. Very little of it will do for quartering, and to saw this wood at a profit requires something different in the way of mill action than is best for sawing high-grade oak and poplar. In sawing up the cheaper and low-grade logs, such as gum and pine, he says he wants to get action, to run things through and produce quantity, in order to get any profit out of that class of timber under present conditions.

When you get valuable oak logs in the mill you don't want your sawyer to run them through recklessly. You want to get all the high-grade stuff possible and get it out in the best shape to bring the top price. When you get men trained to the right kind of deliberation in handling the high-grade logs, then they are inclined to take the same deliberation in handling gum and pine, with the result that the mill does not produce the turnout nor the profit it should.

This argument is logical, but there are so many phases to logging and sorting logs that there is room for much argument. In some cases the matter of logging operations enters. In the case of the man referred to, this is not a strong factor, for he buys logs on the river and can select what suits him best.

Where a man is logging his own timber and has his railroad and log handling equipment, about the only economical way is to make a clean-up as he goes. This means sending all sorts and kinds of timber into the mill all the time. Sometimes the logs may be so piled and distributed on the mill yard that they can be sorted for sawing. The mill may have a run on oak for half a day, then on poplar, gum, hickory, or whatever other timber is at hand. Where logs can be sorted and arranged in this way it is better, because the filer can fit saws for each kind of logs and make the changes when the change is made from one run to another. It is also possible to speed the mill up for the soft timber and slow down a little for the hard timber. Of course the crew would remain the same in each case. Part of the time it would be working hard while at others it would be a little easier for the laborers who do nothing but handle material. It is better for edger men and resawyers to have time for deliberation in cutting the high-grade stock, because they then can get more out of it. An arrangement to sort timber on the mill yard unquestionably helps sawmill operations where there is a general mixture of logs.

The Double Mill

The double band mill may be considered in this connection, one side for big, high-grade logs, the other for smaller timber, and to be operated for quantity. Big yellow pine mills do it this way sometimes, though more commonly they distinguish the two sides of a double mill with one short side and one long side. There is little doubt that the double mill offers some advantage in the way of sorting logs and working them to the best advantage, but the double mill is not so common in hardwood operations as in pine, and conditions are such that it is not often easy or advisable to resort to the double mill for the benefit of sorting logs.

Keep Saws Sharp

A sawyer should learn to push the common gum logs through and then let up on the big clear logs that will make quarter stock or extra high-grade material, and should take more pains with it. This is quite largely a matter of developing habits and of rousing the personal interest of sawyer and block setter. They set the pace for the mill. There is, however, a mechanical difficulty in handling mixed logs through a hardwood mill, some oak, some gum and some poplar and an occasional pine log and then one of hickory. To do the best work on these requires different filing. Some filers claim that hardwoods require a different shaped tooth. Others say it is not so much a matter of tooth shape as it is of set. Some want a closer set for the hardwoods and a wider one for the soft.

Still another matter that enters is that of having the saw sharp and in good shape when a high-grade log comes along. If the saw has been cutting a lot of rough timber and is dull so that it shies and dodges about in a fine dog, it will do enough damage in a little while to pay for taking it off and putting on a new one. Where a man saws mixed logs there should be frequent changing of saws, that the one on the wheels may be in good order all the time.

How Many Resaws

The resaw is now recognized as an important part in the equipment of everything in the way of a pretentious hardwood sawmill. In the making of inch boards the resaw increases the mill's capacity materially, and saves in timber by making a smaller kerf than the mill saw. It has so well proved its worth that we not only find the resaw in most up-to-date hardwood mills, but now and then we find two resaws, and this raises the question of how many resaws are advisable. The writer saw a single band mill cutting oak, sycamore, gum and cypress using two resaws, a heavy one with a blade as large as some mill saw blades for breaking down flitches into boards, and a smaller one of about the regular resaw size for cutting boards into thin stock. The small one was not kept running steadily, but apparently there was enough resawing of boards into thin stock to justify its installation. From this it might safely be concluded that where a mill is cutting mainly one-inch stock or any thickness above, one resaw is enough for one mill saw. If the mill is working panels ⅜, ½ and ⅝ inches thick, two resaws may be justified, one for breaking down flitches into boards and another for resawing boards into panel stock. The best time to resaw boards is while they are green. It makes a little more trouble to handle the thin material, but it produces better stock and facilitates drying. Two resaws may be found advisable, not only for those making panel stock but also for mills catering to the box factory and box shook trade, which might do the resawing of the box stock while it is green instead of shipping it full inch thickness and letting the box factory resaw it.

The Belt Tightener

A gravity belt tightener, playing on the loose side of heavily loaded belts, has been a part of the sawmill equipment from the earliest days. Twenty-five or thirty years ago it was thought necessary to put a tightener on practically every belt in the mill. By and by there grew up a fresh army of millwrights with new ideas, one of which was that the tightener was a cumbersome nuisance and that there was enough elasticity in good belting to make tightness unnecessary. As a result of this new idea large woodworking establishments with a number of big belts as well as small ones were installed without a tightener. Not only was the tightener eliminated but the endless belt idea gained favor and belt stretchers were a part of the equipment of every establishment.

It was never practical to entirely eliminate the tightener from the sawmill, because the main drive belt still demanded it. It was eliminated, however, from nearly everything except that and slack belts used for intermittent service, such as log haulups.

It looked as if the old gravity tightener had been killed, but a few years ago it began to come back. Some builders of planers discovered that by using a properly designed gravity tightener they could insure better work and less strain on their planer belts. They made a series of tests to be sure of it and then featured this as one of the strong points of their planers. They were doing perhaps more than they thought because they were not only boosting this planer but they were helping the tightener to come back. To-day it is in favor again, and is proving that it is better than to depend on tight belts and the elastic element of the belts themselves. The new tightener is more carefully designed and better hung than the old one.

The Quarter Twist Belt

One of the things the mechanical world has learned about belting is that a great length of belt is not needed to get an elastic element and keep motion steady. Machinists used to argue that a certain length of belt was necessary, and figured out elaborate schemes of distance spacing for shafting on belt drives of different kinds. About the time all this seemed perfected along came the electric motor and proved that short belts would do just as good service as long ones and that the motor could even be hitched direct to the planer spindle without any intervening belt and do good work. This has destroyed faith in the old idea of wide spacing for belt drives.

There is, however, one order of belting that still requires some spacing and that is the quarter twist belt. It is about the meanest order of belting that was ever designed and every mechanic and millman hates it. Still there are times when it must be used to get a right angle drive. For such a belt one should have some distance between the drives, for if they are placed closely together the belt must slip in coming from one and making its twist to go on the other pulley, and the result is a disposition to squeal, especially if one has been using a dressing on the belt to keep it from slipping. To reduce the amount of slip and keep the wear down to a minimum one should space the pulleys of a quarter twist drive as far apart as practicable.

The original arrangement for slack belt drives for intermittent service consisted in mounting the belt on the overhead pulley, which was in operation intermittently. In other words, the drive was below, and when not in use the belt simply hung down loosely around the driving pulley and remained idle. When service was desired of the belt it was tightened up with a swinging tightener, and to stop operation the tightener was simply released. There are, however, instances where the drive is overhead, especially in mill planers. In these cases when the tightener is slacked off and the machine stopped, the belt keeps running and simply playing loosely around the lower pulley. Some of these planer belts operate at pretty high speed, too, and while mechanics have gotten away with this proposition, it is really a dangerous looking thing and a thing to be avoided in slack belt drives. It were better to use a loose pulley and a friction clutch than a slack belt running while the machine is idle, or better yet to use an electric motor where practicable. The only ideal combination in a slack belt for intermittent driving is the original arrangement with the drive below and the drive pulley smaller than the other. Then when the belt is slack it will hang idle and drop away from the driving pulley. Wherever a departure from this arrangement is required it is generally better to use loose pulleys and friction clutches and dispense with the slack belt.

Paper Friction

Nothing has been found to serve the general purpose of friction drives better than the combination of paper and iron. Before the days of steam feeds, paper friction was the centre point of mill feed works, and it is there to-day in the smaller mills and practically all of those not using steam feeds. It also enters in the mill for various intermittent drives and for variable speed drives, and sometimes for right angle drives to eliminate the quarter twist belt and the noisy gear wheels. The paper friction is almost an ideal drive, too, when kept in proper condition and well faced against the metal.

There are only two general sources of trouble with paper friction; one is moisture on the face that keeps it from taking hold, and the other is lack of alignment, preventing it from facing closely across the full width of the drive. The intermittent friction drive has a shifting gear either for the paper wheel or the metal one, and sometimes as the face wears down a little this shift is not carefully adjusted. This brings the faces out of alignment and reduces efficiency. The other trouble, that of moisture, has many remedies, about the best of which is to cover the drive over and safeguard against moisture. Dry ashes are dusted on the moist wheel and make it take hold, or dry sand will answer. Some seem to think that by getting oil on the paper it may eventually become moisture proof. The trouble is that oil is practically in the same category as moisture and keeps the paper from taking hold until it is dusted with ashes or something else. Perhaps a better preparation for dusting the paper friction is a powdered resin. Even this should be used sparingly, however, and the paper kept protected from moisture and oil and the two wheels of the drive so aligned that they will face up all the time. Then one should get satisfaction right along out of a paper friction.—Hardwood Record.

The most effective safety appliance yet discovered is a careful man.

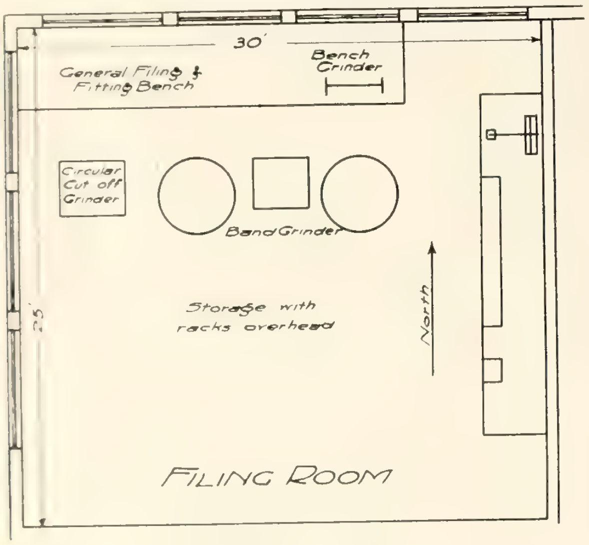
QUESTION BOX

A Practical Department of Reference for the Practical Man

Floor Space for Six-Inch Resaws

Q.—"Please advise me in regard to what saw filing equipment should be procured for taking care of three six-inch resaws and about fifty circular saws of various sizes and kinds. Also, can you give me an idea of how much floor space would be required for this machinery, and the best locations for same?"

A.—You will require for this layout, an automatic 8-in. band saw grinder with an attachment for gumming and sharpening circular saws, which will come a lot cheaper than buying a separate machine for the circular rip saws of which you will of course have quite a number, a scarfing machine for preparing brazes, a brazing clamp and set of irons, a levelling block and anvil with at least one round and one flat-faced hammer, a tension rolling machine and two swedges of the best make you can obtain, one for the band and one for the circular rip saws, also pressure side dresser, levels and gauges and a straight-edge at least four feet long. You should have for the circular cut-off saws an automatic grinder, large enough to take in the largest saw you will use, while the smallest and the ones for fine work will have to be filed by hand. Provide a good bench clamp for holding saws for hand work and a bench grinder with attachments for grinding cutters. Select a location facing the north if possible, allowing at least seven hundred square feet and plenty of windows. There are many arrangements of machinery possible, the attached sketch giving a general idea. For the very best results, you had better locate your filer and let him plan it as he wants it.



Filing room lay-out.

The Waste Problem

Q.—"As a subscriber to the Canadian Woodworker, I should like to ask whether there is anything into which I can work the waste from a sash and door and blind factory. I have a large amount of pieces of pine from windows and basswood from doors. These I can make no use of except for short frieze spindles, which are seven inches long by one and one-quarter inches square, but we take more of them than we can sell. Is it possible to install at a small outlay a machine for manufacturing matches, pencils, or some other small article? Is there a market for hardwood dowels or tooth picks? We have quite a lot of waste in that direction, but not so much as soft wood."

A.—This question which you have asked is the same one that is vexing every other woodworker in the business, and when you ask for some outfit which at small expense will enable you to utilize the waste pieces, you have asked for something which is next to impossible, for it is all that most manufacturers can afford to do to manufacture the articles which you would make from whole and sound stock. Generally speaking the better the stock the less the cost of manufacture, so that in order to make any of the articles you have named in competition with the others and from waste material, you have to have equipment even better than theirs, which cannot generally be had at a small outlay. Soap manufacturers get a large revenue in the form of glycerine from what used to be a total waste, but the glycerine plant is the most complicated and costly part of the whole soap factory, so it may be with the wood waste. Certain it is that anyone who manufactures from wood is over-run with small pieces from which to make the articles you have named, consequently the prices paid for them are too small to warrant consideration from an outside supply. This is especially true regarding toothpicks, matches, dowels, etc., and in addition there are in the business at the present time more than enough companies to supply the demand. Pencils require special kinds of wood and are out of the question. I am sure that if you are to reap any real benefit from this waste you will have to try something new, and the following suggestions are offered for what they may be worth. **Toys.** The supply of toys made from wood, which has heretofore come almost exclusively from Germany, is at present cut off completely, and consequently there is a demand right now for innumerable things made from small bits of wood of various kinds, which, if you could secure the right kind of help, would reduce your waste pile to nothing. This line requires a special kind of ability but it must be, with the vast numbers of immigrants coming to this country every year, that you would find among them men with the necessary experience. It all depends upon how much waste you have and how far you are prepared to go. **Excelsior.** Basswood, of which you say you have a considerable quantity, is a good material from which to make excelsior, for which there is a good market; and while we do not know of any machinery designed especially for working up waste, we believe that machines could be made easily, should you place your proposition before manufacturers of that kind of machinery. It might be that the basswood, being especially suited to excelsior, would furnish a long and curly fibre which would take in mixture a good portion of your pine, without lowering the grade. **Electrical.** Manufacturers of electrical machinery use a lot of small pieces of hardwood, such as meter backs, insulating plugs winding retainers in motors, etc., and generally these are made under conditions which would permit you to get in. Also brush makers generally buy their **handles** ready-made, and these range in size from quite large to very small and are made in a number of different grades. **Piano actions** contain numberless small pieces of hardwood. There have also been some investigations made for the distillation of wood into a number of products, which may or may not have reached a successful stage. We are inquiring further into this matter and will advise you of what we find in another issue.

Covering for Band Saw Wheels

Q.—"We are having considerable trouble in finding a proper covering for our small band saw wheels. Can you tell us what is the proper material and how it should be secured to the wheel?"

A.—Each manufacturer of band saws has an idea of his own regarding covering for the wheels, consequently there is a pretty wide diversity in the wheels themselves and the provision for holding the cover. If you can afford the time and have a skilled belt man about the place, let him cover the whole with leather, glueing it on the same as he would cover a pulley with a leather face. This will last a long time, and takes care of your old leather, but on the other hand if you want to carry the covers in stock made up against emergency, you had best get rubber ones, woven like an endless rubber belt, with a strong duck base and a thick coating of rubber on the outside. It must be made to go on very tight, and be fastened with shellac or some other adhesive that dries hard and will stick to rubber and metal. Such bands cannot be turned up two or three times like a leather covering but have their advantages, and the cost is probably about the same in the long run.

The Grounded Wire

Q.—"We were much interested in your description in last month's Woodworker of the results of grounded wires in electrical installations. It looks as though we had something like that in our mill, but must confess that we are unable to find the cause, whatever it may be. We have made the testing rig described, and find that the lamps will sometimes simply glow, sometimes light up brightly and then again we get no light at all. Does this indicate a ground, and if so, how are we to proceed about finding it?"

A.—It is evident that you have something grounded in your system, and by the action of the tester, it would seem to be in some circuit that is not in continuous operation, or which is dead part of the time. This is most likely to occur in the short length of wire and pipe leading from the switch or controller to the motor or in the windings of the motor itself. If the latter were the case, however, the motor would smoke and finally get on fire, on account of the close crowding of the wires in the slots, so, as you have mentioned no trouble of this nature, try the former place first. Connect up the tester and watch it, at the same time keeping tab on the machines which are being started and stopped frequently, and whose time of running seems to coincide with the occurrence of the ground. The chances are that you will spot the guilty party at once, and you can verify your find by trying the motor and at the same time watching the lamps. If they glow when you turn on the current, the trouble is between the box and the motor. Look over all places where the wires might chafe through the insulation. When you find the place, there will be a bare spot on the wire and a burned spot on the metal surrounded with a bluish whate halo, and sometimes there will be a drop of fused metal sticking to one or the other of the surfaces. Renew the insulation with rubber and friction tape and remove the cause of the chafing and your troubles will be over.

Machinery for Screw Driving

Q.—"We have a great many screws to drive in our line of business and have yet to see a machine which would do a really satisfactory job of driving. Do you know of any recent developments in this line that would help us to get away from hand work?"

A.—We do not know of any machine which will do this work as well as it can be done by hand, using the ordinary screw with the slotted head, but believe that if you will turn your attention to screws with square holes in the heads in place of the slots, you will have better luck. Such screws are made in this country and are especially adapted to rapid driving, particularly by machine, the tapered square driver point readily finding its proper place in the head of the screw without the special attention on the part of the operator which is necessary with the slotted head. We believe a machine could be made using screws of this kind which would feed the screws from a hopper automatically as required, and fitted in this way, your cost of labor in that direction would certainly be reduced. We shall look into this matter further, and if there is any information we can give you at any future time, we shall be pleased to print it for the benefit of yourselves and others of our readers who have a similar problem.

Applicants for Patents Volunteering for Service

Q.—"What is the position of an Applicant for a Patent or a Patentee who has volunteered for active service and thus is unable to attend to the prosecution of his case."

A.—It is generally known that in all Patent offices certain rules are laid down restricting the length of time in which documents may be filed, renewal fees paid, and so on.

In Great Britain an Act has been passed under which the Comptroller of Patents has the authority to grant extensions of time for the filing of such documents, the duration of such extensions being governed by the particular conditions of the case. This provision is made for the benefit of Applicants or Patentees who are absent from their country on active service or for any other justifiable reason are prevented from attending to their cases by circumstances arising out of the present state of war. Also, the extension may be granted when it is shown that the documents could have been filed, but under the circumstances arising from the state of war would be prejudicial to the rights or interests of the applicant or patentee. The British Patent Office has also made arrangements regarding documents intended for countries at war, in which the lodging of documents may be difficult. These documents should be filed through the British Patent Office, when the Comptroller will date-stamp them, retaining them until such time as conditions would make it safe to forward to their destination. By this means, official evidence will be shown that the papers were duly executed and forwarded for filing on specific dates. Foreign renewal fees, etc., may also be paid in a like manner.

In Canada, a special Order-in-Council has been made under the "War Measures Act, 1914." The gist of this is as follows. The Commissioner of Patents is given power to annul or suspend, wholly or in part, Patents which are held by or give benefit to any person who is a subject of a State at war with His Majesty.

The avoidance of such patents does not come into force automatically, as is generally supposed, but only upon request being made to the Commissioner of Patents by some person who intends to manufacture the patented article, or otherwise commercially promote the same in a manner calculated to be in the interests of commerce, either throughout the Dominion or locally.

Applicants for the avoidance of Patents under this Act should present at the Patent Office together with the prescribed fee of $10 a petition. The Commissioner will then, if he deems the application warrants it, annul the patent either totally or partially, and retain the right to revoke such voidance or suspension at any time if necessary. Where the case demands, the Commissioner may impose certain terms. Subjects of a state at war with His Majesty are also liable to have any of their Proceedings on Patent Applications voided or suspended. Provision is also made to prevent subjects of a state at war with His Majesty from making Assignments of their Patents for the purpose of avoiding the provisions of this Act and such Assignments are liable to be declared invalid. Manufacturers purchasing German or Austrian Patents, at the present time, should take particular note of this fact. The same provisions as in Great Britain regarding Patentees or Applicants for Patents, who are on active service, have also been incorporated in this Act, and extensions of time for fulfilling requirements of the Patent Law are granted in the same manner, and under the same circumstances. Several applications have already been registered by Canadian manufacturers for the annulment of patents under this Act, and it is to the benefit of the community at large that full advantage should be taken of these provisions.

Exhaust Steam for Dry Kilns

Q.—"Is exhaust steam really feasible for heating a dry kiln, and if so, what are the more important features to be watched in further investigation?"

A.—Exhaust steam certainly is feasible in dry kiln or any other form of heating, as the exhaust from even the very best and most perfect engine contains more than half the heat imparted to the water in the boiler. To exhaust this direct to the atmosphere is an unnecessary waste, and while the saving by using a condenser and vacuum pump helps considerably, there is a large amount of heat wasted which can be turned to good account in heating systems. To get the best results from exhaust steam, the pipes should be large and plenty of them provided and just sufficient back pressure carried to insure proper circulation. The drips should be carried direct to the boiler through suitable traps, and should be carefully covered to retain all the heat left in the water. All heating pipes should have sufficient inclination to insure freedom from clogging with water, and air cocks must be provided liberally to prevent the formation of air pockets. There is a great deal of practical information available on this subject of Heating by Exhaust Steam, as you will see by perusal of any list of technical books. It is a system which is capable of returning large economies if properly handled, but each system has its own peculiarities, and it will pay you to take the matter up with the makers of dry kilns, heating systems, etc., and also with the makers of open feed water heaters, which are peculiarly adapted for use with exhaust steam heating.

Wood Temperature and Glue

Q.—"Just what effect does the temperature at which the veneer and the core body are used have upon the glue in the amount of moisture that should be used in it? We know that when the wood is hot it will take up moisture more readily. Therefore, should there be more moisture in glue when it is used on hot wood, or less, and why?"

A.—Hot wood is naturally hungry for moisture, but that is no reason why you should put more moisture in the glue used on it. In fact, it is the other way around. When the wood is warm or hot, it tends to thin the glue, consequently the better practice is to use a somewhat thicker glue—that is, a glue of heavy body—to prevent the glue being all absorbed into the wood and robbing the joint.

Differences in Glue

Q.—" Sometime ago I noticed in the Question Box some information which, while intended for another, helped me materially in reducing our glue expense, and incidentally in securing a raise for myself. Now there is another question upon which I would like some light, which if you can oblige me will be greatly appreciated. Is there any difference between ground and flake glue at the same price, and if so, what?

A.—Of course, there are exceptions, but if you buy your glue in accordance with the suggestions made in the Woodworker in the issue to which you refer, it makes no difference whether your glue comes ground or not, the grinding being simply to make the glue easier to use in that it does not require as long soaking, which tends to weaken the batch. By using ground glue, you can make your supply up fresh every morning or twice a day and secure considerably more strength than as though you used flake glue and soaked it over night. This long soaking may be all right nine times out of ten, but the tenth time someone fools with the steam valve and the glue is kept hot all night; then you wonder what makes the joints open up.

Decreasing Friction

Q.—"Our planers have plain bearings about twelve inches long and 2 3/16-in. diameter and are oiled by felt wicks through ordinary oil holes and slots. We have no particular trouble with heating, for we insist on our men attending to the oiling, but they take such a large amount of oil and so much time and attention that we are inclined to try and discover a way to decrease this expense. We have tried graphite inserts and two or three kinds of stuff for elimination of friction but without success. Can you suggest through your columns, something to help us out?"

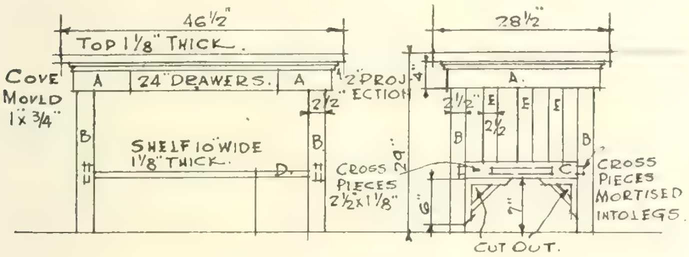
A.—The solution of your difficulty is grease, but do not make the mistake of assuming that all greases are alike and that anything thicker than oil is grease with real lubricating value. The Keystone Lubricating Company, of Philadelphia, Pa., have devoted a lot of attention to the solution of problems just like yours, and you may rest assured that the following of their rules for babbitting, cutting oil grooves, etc., which they furnish gratis, and the use of their grease according to directions, will decrease your friction load as far as possible without using ball or roller bearings, and save about fifty per cent. of your lubrication expense in material alone. What grease saves through the saving of time in oiling up is considerable. We would suggest that you write them for further information.

The Construction of a Library Table

By Hugh H. Chambers

THE library table described below is made entirely of oak except the drawer, which is white pine. It is 46½ inches long, 28½ inches wide, standing 29 inches from floor to top. The legs are made of 2½-inch square material, top and lower shelf are 1⅛ inches thick. The lower shelf is 40½ inches long and 10 inches wide. The drawer is made flush with rim. To make, first plane all material to a good smooth surface, scrape it, then go over it with No. 1½ sand paper, finishing up with No. 0. Then cut the pieces so as to make the top one inch longer than the finished top to allow for the final dressing. Joint them perfectly straight and square, then glue and dowel them together and set aside, leaving clamps on.

Glue should be allowed to dry for thirty-six hours. Next make the rim marked AAA, cut two pieces 1 x 4, 42½ inches long and two pieces 24½ inches long (these are mitred on the ends.) Nail these together, square it up, and nail brace on to hold it temporarily.



Details of oak library table.

Lay it aside and cut four pieces 2½ x 2½, 27⅞ long for legs. Mortise each on as shown for cross pieces marked C on drawing. Cut tenons as C 2½ inches between shoulders, fit into legs, glue and fasten with a round head brass screw into each leg. Now cut lower shelf marked D, 40½ inches long and fasten thin pieces marked C with three round head brass screws, 2½ inches long (i.e. 3 into each end of shelf).

Take rim marked A and nail on legs, keeping top edge flush with top of legs. The pieces marked EEE are 2½ inches wide, 15 inches long, mortised one-half deep at bottom into cross pieces marked C. Fur out on the back of A sufficient to make the pieces EEE stand plumb and nail well. The brackets marked FF are cut from ⅞ material, 6 inches long each way. Cut four of these and nail to each leg, centering in on piece marked C. Take the top and place on legs and mark all around, allowing 2-in. margin. Cut to this line and smooth up edges, rounding off sharp corners with sand paper. Lay the top wrong side up on bench, take bottom part and set on top of it, same as the whole table turned upside down, and fasten legs to top with four screws on a slope of 45 degrees into each one. Next cut out piece on one side for drawer, cut it with very fine saw so as to not leave crack at each end of drawer when finished.

Glue and nail blocks on inside of AA after drawer head is cut out. Rabbet the drawer head on each end and bottom. The bottom is rabbeted 1-inch wide to allow for slides under finished drawer.

These are made of ½-in. material. The cover mold is now put on all around and on drawer head. The drawer is without knobs or pulls, as sufficient space is found on bottom for the fingers in pulling it out.

To make a neat job a shaving should be raised with a small gouge for each nail and after driving and setting nail should be glued down again. Good results can be had, however, by puttying nail holes if one is very careful in coloring putty.

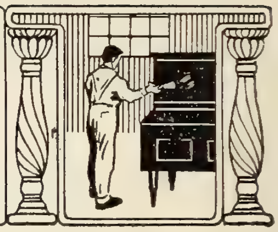
Below is list of cost of material required.

Lumber.—Oak 18 ft. 1⅛ x 12 for top and lower shelf.
10 ft. 2½ x 2½ for legs.
12 ft. ½ x 2½ pieces on ends.
12 ft. 1 x 4 rim around top.
2 ft. 1 x 6 brackets.
12 ft. 1 x ¾ cove mold.
12 ft. ½ inch white pine for drawer.
Paint.—1 lb. dark oak paste filler.
1 pt. clear varnish.
Hardware.—8 round head brass screws 2½-in. long.
16 1⅛ iron screws for fastening legs to top.
½ pt. liquid glue.
½ lb. 6 penny finish nails.

England claims to have the largest oak trees in the world, and the claim appears to be pretty strong. Lord Powis recently sent to a London paper the dimensions of three oaks growing in Powis Castle Park. These are the Champion Oak—height, 105 feet; girth 23 feet 6 inches (5 feet from ground); contains 2,026 cubic feet of timber; the Giant Oak—height, 92 feet; girth, 29 feet 7 inches (5 feet from ground); contains 1,925 cubic feet of timber; and the Wilderness Oak—height 95 feet; girth, 22 feet 4 inches (5 feet from ground); contains 1,617 cubic feet of timber. Lord Powis points out, there are trees of greater girth than these, but the two largest, the Champion and Giant oaks, are said to contain more timber than any other oak trees growing at the present time. Though trees, he says, containing 1,000 cubic feet of timber are rare nowadays, they must have been fairly common at one time in the oak-growing districts of England and Wales, as is evidenced by the fact that in 1793 and 1796 no fewer than 26 trees, each containing 1,000 cubic feet and over, were felled in Vaynor Park, Montgomeryshire. The largest of these contained 1,322, and the smallest 1,127 cubic feet.

An old tree trunk, with fossil bones of the Tertiary period, was recently excavated near Los Angeles, Cal. The trunk of the tree, 18 inches in diameter, and one whole block, were recovered in excellent preservation. The tree was a cypress (C. manalcana) a species which still exists in California. It is estimated that this tree grew 100,000 years ago.

THE FINISHING ROOM



Helpful Formulas for the Department Foreman

Specially Contributed by Walter K. Schmidt

THIS is the day when the artisan looks to his trade paper for authentic information. In turn, the trade paper in its endeavor to become of value to its readers, and thus of greater value to its advertisers, seeks to disseminate information couched in such language as to be comprehensible to the craftsman and the artisan.

In connection with this, the writer wishes to state that it has long been his opinion that a grave error has been made by many Finishing Departments of the larger manufactories in guarding the details which are so valuable to the other industries. By other industries are meant concerns making chairs, others making sideboards, and the various lines ultimately arriving on one dealer's sales floor. The results have shown variance in shade, no matter how hard the maker strived to get the shade identical. It is almost an impossibility unless the more detailed information be at hand. What are the results?

Mrs. Brown selects a dining room table, made in X, a sideboard made in Y, and chairs made in Z, only to find that there is not the uniformity of shade that there should be. This is where the salesman encounters difficulty. It is a condition that should not exist; it is a condition that does not help the industry; and the reader need only attend a salesmen's meeting to obtain confirmation.

Foreman finishers have been prone to regard their formulas as secrets. Without wishing to speak disparagingly of this habit, the simple fact remains that it is nothing more than an illusion. These men have kept the finishing department behind the times. Only a few years ago, anybody who ventured to print methods as employed in furniture factories was ridiculed. The stuff he undertook to write was termed "bosh." Later it was found that these published methods were being gobbled up and carried around in vest pocket memorandum booklets as trade secrets. Occasionally they were permitted to travel on to a favored few. Had there been a free interchange of information, the possibility would have been at least greater harmony in the finished product. This has nothing to do with design. I am talking to the finishing department. Therefore, when it comes to a trade paper offering to furnish the much-sought-for information, it needs the information that is authentic and whose methods are consistent with the present-day application.

Herein the writer answers a number of requests collectively. Inquirers will find their answers covered in the articles.

Varnish and Paint Remover.—It is true this can be purchased, and undoubtedly those made under American patents are very worthy products. But when one considers the royalty paid by the manufacturer to the patentee they are rather expensive as compared with the intrinsic value of the component parts of very efficient home-made varnish removers. Hardly a factory exists that does not have occasion to use a varnish remover, but still a greater demand exists for spasmodic use of this article in the retail furniture store. In the former it is often called upon because a finish has gone wrong, or the shade is not as ordered, or a piece finished one way and in stock would be found preferable to change the finish rather than to run a new one through the factory. In the latter, we will say that Golden Oak chairs are on the floor, but Mrs. Brown would like them in Early English—to match a certain dining-room table that particularly struck her fancy. It is a well-known fact that the larger furniture stores have a finisher whose duties it is to do this transformation act. He needs a bit of varnish remover, and with formulas at both of these places it is an easy matter to prepare this commodity when required.

Here, then, are two formulas, either one of which may be used with success.

Benzole	5	quarts
Acetone	2½	pints
Carbon Bisulphide	½	pint
Paraffine Wax	2	ounces

Mix in order given, or

Benzole	1	gallon
Fusel Oil	1	pint
Acetone	1	pint
Paraffine Wax	1½	ounces

One has only to get the market price on these articles and figure the cost of a gallon to convince himself that the formula is an asset. That either of these formulas will do the work is a fact readily established. For the dealer not situated in the market and who might wish to use a varnish remover, the following formulas whose component parts are obtainable in almost any market are recommended.

Water glass	5 parts
Soda Lye	1 part
Ammonia Water	1 part

Spread this over the work, no matter how old or hard, it will be softened in a few minutes, and can then be readily scraped off. Or there is this formula:

Sodium Hydrate	5 parts
Silicate of Soda	3 parts
Flour Paste	6 parts
Water	4 parts

Or

Soap	10 parts
Potassium Hydrate	7 parts
Sodium Silicate	2 parts

By Potassium Hydrate is meant the Caustic Potash, or, if this is not obtainable, the Caustic Soda. The only precaution necessary is to clean up the work thoroughly, see that all the corners are well taken care of, and if there is any of the varnish remover remaining on the wood, be certain that it is thoroughly cleaned off. When the alkaline formulas are used, ordinary sponging with water will do the cleaning, but where those made of Benzole are employed, it is best to wash the work with Naphtha.

The inexperienced workman would be apt to encounter difficulties in the corners or any crevices that might be found upon the piece of furniture, and that is why I particularly caution a thorough cleansing of the work, for it will be difficult to put on a successful finish unless every trace of the varnish remover is removed.

Speaking of the use of varnish remover, it must be understood that it very seldom affects the filler. This has to be taken into consideration, for example, in turning Golden Oak into Early English. The Golden Oak has a brown filler, whereas Early English has a black filler. In cases of this kind, the pores are opened by the use of naphtha and a picking brush, and if the filler will not answer to the use of naphtha and the picking brush, the addition of a little varnish remover, made of the first-named formulas, will greatly assist. Then after the work is cleaned in this way, wash with naphtha, sand thoroughly, and dust off carefully.

Should the stain coat not be entirely removed, a large proportion will come off in the sanding, and the small amount that is left can be overcome by taking it into consideration when applying the new stain.

Practical Points on Varnish and Varnishing

USE clean varnish, a clean pot, clean brushes and clean clothes or overalls. Never wet the brush with oil or turpentine while you are applying the varnish. Be careful not to brush the varnish too much, for that is sure to injure the gloss, writes A. Ashman Kelly in Wood-Craft.

A varnish job should be kept in the warm until it is quite dry, to prevent chilling. See that the surface of the work is clean, free from dust, dirt, grease or marks, and that it is smooth, if you would have the varnish bear out with luster. It is equally important that the work be free from moisture and grease to prevent a "blotched" job.

If the brush is too small, or you work the varnish too long, there will likely be brush marks to show up.

Do not conclude that, because the surface of the varnish is dry the varnish is dry through, for it may or may not be dry through.

If the varnish coat is too thin it will not stand out well, and if too heavy it will not spread and level up smoothly. A light-bodied varnish brushes out easily and does not show brush marks, as heavy varnish is apt to do unless very carefully applied. Heavy-bodied varnish should not be brushed out much, but should be flowed on in a full coat, so that it will level up of itself.

Time Required for Drying

Each coat of varnish should have all the time for drying it is possible to give it before applying the next coat. A coat of ordinary varnish should have not less than one day of 24 hours for drying, and two or three days will give better results and pay for the time. Use the varnish that is made for the purpose in view. Never use a varnish for something it was never meant for. Never turn back into the can any unused varnish, but place it in another can, one kept for the purpose. Label it, and keep for doing jobs that are not particular.

Good work should receive at least two coats of varnish, rubbing down the first one with pumice and water a little, before applying the second coat.

Flies, dust and dirt are bad for the varnish-room. To kill off the flies have some poisoned fly-paper or formalin and water in a saucer, and place it in a window where the flies will seek the light.

On light-colored work the varnish is sometimes thinned to make the coating clearer or lighter of color, but it is a mistake. Better use a light-colored varnish, and there are some very light-colored copal varnishes.

Never add cold oil or turpentine to the varnish if it is desired to thin it, but heat the varnish and the thinners, before mixing, then mix and shake well. Too much oil added to a varnish will make the coating too soft, while too much turpentine will impair the luster.

Apply the varnish neither too heavy nor too light, for if too heavy it is apt to crack, while if too thin it will give to the work the appearance of thinness.

Value of Light for Varnishing

Varnish will dry better in the light than in the dark. Hence have the room where the job is placed when done where it can get plenty of daylight. It has been observed that varnish will dry much better in the daytime than at night, hence varnishing done in the morning does better than that done at the end of the day.

Varnishing demands plenty of good light for the varnisher to see right, and good eyes are essential. A young man with good eyes should make a better varnisher than an older man whose eye-sight is impaired, even though he wears glasses. Glasses do not make up in full for eye deficiency.

Some varnishes dry upon the surface and mislead us to think that the mass is dry through. If then we apply on the top of this undry coat another coat of varnish there is bound to be trouble later on. It is always best, therefore, to allow plenty of time for the drying of varnish.

Turpentine is bad to keep the varnish brush in, because it not only impairs the spring or elasticity of the brush, but the turpentine gets into the varnish and causes specks.

When you drop your varnish brush on the floor, hold it over a cup and pour benzine over the bristles, to wash off all dirt. Then place it in clean varnish and work it in that; then work the brush over a knife edge into a cup. Repeat the operation until the brush is perfectly clean.

Never expect to get the best results from a good varnish if you apply it in a damp atmosphere. Cold, too, is bad. In cold or damp weather see that the varnish has the chill off, placing the can in warm water until warm through.

Take into consideration the size of the object that is to be varnished when selecting the varnish brush. Use a large brush for a smaller area.

Sometimes a bristle brush is best for applying varnish, and at other times a hair brush will be found better. It all depends upon the character of the varnish, and also of the job.

Some prefer an old paint brush, well washed out and made clean, for applying heavy-bodied varnish. For ordinary well-bodied varnish an elastic hog bristle brush is best. Such a varnish needs a stiff bristle to cut it through and spread it well. Cutting through allows the air to enter.

Varnish requires air and ventilation if it is to dry properly. Varnish in the sealed can does not dry, but remains liquid. Unseal it, and it skins over pretty soon.

The varnish-room must never be an airtight room, but have plenty of fresh air and ventilation.

It cannot be claimed as a particular virtue for a varnish that it dries very slowly, though a quick-drying varnish is usually not long-lived. A varnish may dry very slowly because long on oil, or because the room is too air-tight.

Gum sandarac varnish is used for finishing the sounding boards of the piano. It is a hard varnish.

Varnish that contains fish oil dries sticky and is for any practical purpose entirely worthless.

Qualities Obtainable in Varnish

The most brilliant varnish is made from mastic, the toughest from shellac, and the hardest from sandarac.

Copal varnish varies from a light amber to a dark rich brown tone, depending chiefly on the whiteness of the gum.

Piano varnish has little oil and dries so hard that it takes a very high polish, quite too hard for ordinary use.

For interior use, subject to much handling, and where a brilliant gloss is desired, a hard gum, short-oil varnish should be used.

Varnish in order to withstand the action of water must contain enough gum to prevent the linseed oil from turning white or milky. It must contain much oil, it should also contain some wood oil.

Railway and carriage body varnishes, implement, coach, and other durable body varnishes usually contain an excess of oil, and hence are said to be "long-oil" varnish.

For furniture not subject to rough use a rosin short-oil varnish will do, while for furniture subject to hard use a medium or long-oil varnish should be used. As a rule the most durable varnish is a long-oil varnish, but the luster is not so good, though the varnish will prove more durable than the short-oil varnish. The long-oil varnish is also tougher than the short-oil varnish.

A long-oil varnish will take the thinners at a lower temperature than a short-oil varnish.

It is easy to see that the varnish-maker has to have a varied and extensive experience in making varnishes.

For mixing with pigment or white base, for making an enamel, the varnish must be light of color, and the gum from which it is made must be so treated that when mixed with certain pigments the mass will not liver or thicken.

The very best varnish will deposit some sediment upon standing in the tank, but it will be less than one-fourth of 1 per cent. in several months. A poor varnish may and frequently does show as high as 7 per cent. of sediment or "foots" upon standing that long.

The varnish that dries quickly will not prove to be a durable varnish; the varnish that dries slowly hardens more thoroughly and retains its elasticity better than the quick-drying varnish.

Manganese varnishes are of lighter color than those prepared with sugar of lead, litharge, red lead, pyrolusite, etc. They resemble more nearly in color those made by the action of atmospheric air or the direct action of oxygen gas.

The Finishing of Cheap Furniture

THE vast amount of cheap finishing makes the subject one of great importance, for in this class of work there is keener competition than in high-class work. I have sometimes thought that it required a higher skill to do cheap work successfully than to do the best grade of finishing—that is to say, from the business end of the matter. And this cheapening must be in the actual finish or surface work, not in the foundation or filling. With the proper filling or foundation a cheap finish is most likely to stand well. Some employ boys or other unskilled labor on filling when the idea is to save. It is a mistake, sometimes a very costly mistake. A skillful workman in the filling will turn out double the work a boy or other unskilled laborer will turn out, and his work will be done right. He will secure the best results with the minimum of labor and material.

Straight-grained oak is used on cheap furniture work, also for medium-grade work. For such we would take from 12 to 14-lb. of paste filler to the gallon of thinning fluid, whatever that may be. This filler is applied and allowed to stand until it turns white, a matter of ten or fifteen minutes, usually. If not given sufficient time, the filler will fail to settle into the pores of the wood, so that wiping off too soon, while easier to do, will result in pulling out some of the stuff that ought to go into the wood. Tow is very good for rubbing the filler with, gathering the filler and becoming a pad of tow filled with filler, a fine condition for the rubber to be in. Rougher material, like excelsior, will take the filler off in streaks, and will not allow you to press the filler well into the wood.

After filling the wood let it stand for from twenty-four to forty-eight hours, then sandpaper lightly with old paper or very fine new; the idea being to not cut the corners, etc. On cheap work it is a rule not to sandpaper the filling at all, but a light rubbing makes a great difference in the finish. However, one must be guided by circumstances. On the filling should be placed a surfacer, which is made by many of our factories for the purpose. This should have a mineral base, as then it will bind with the filler and form a hard, impervious coating, bearing out the varnish coats well. A good surfacer is easily applied, easy to sand, dries hard, and has good covering quality. As the surfacer covers well, it becomes an economical factor in the finishing. After this surfacer has had time to become dry and hard apply a good, heavy coat of varnish. Coach or rubbing varnish, as you prefer.

Elm has a larger pore than oak, as a rule, though one that is not quite so deep as that of oak or ash, hence can be filled easier. It has the disadvantage of having a fuzz, technically known as whiskers. This fuzz occurs in patches, catching the filling and forming dark patches. Do not use past filler, but make up a liquid filler, as follows: Take some liquid filler and break up paste filler in turpentine in amount to equal the liquid filler, then mix the two together and add half as much turpentine as you had of either of the other two ingredients. Stir thoroughly together. Add any coloring desired. Apply with a flat chiselled varnish brush, bristles. Brush to be 2½-in. wide.

Spread carefully, uniformly and evenly, wiping off the edges. Lay it off as in a staining job, then allow it to stand until the filling becomes flat or lusterless. This will take about fifteen minutes. Let it further stand for twelve hours, when it may be lightly sandpapered with No. 0 paper; make the surface smooth, then apply a primer coat; let this stand twelve hours, then smooth with fine paper, after which apply a coat of rubbing or other varnish, depending on the kind of finish desired.

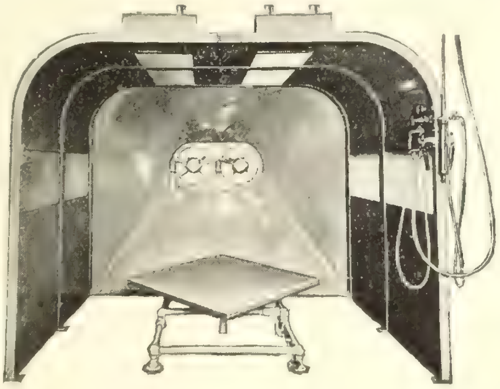
As elm often contains sap spots, which will show up in the finish, they must be stained to make a uniform surface; do this after the filling and sandpapering, with soft cotton rag and water color, burnt umber or Vandyke brown.

In finishing cheap work a cheap varnish is used, of course. But the cheap varnish of today is far superior to the cheap varnish of other days. No one can make a good wearing varnish with rosin. Even Manila gum will not make as good a polishing varnish as the real Kairi gum; it will polish, alright, but it will not hold luster as the Kairi will. Nor will Kairi do with some rosin in it. It takes a lot of rubbing to get a polish on such varnishes as these. And, after all, when we consider what an amount of surface varnish will cover, it is a wonder we should care to use any but the best. Not the highest priced for cheap work, but also not the lowest priced. Some furniture finishing varnish contains three times as much oil as gum, hence can never become hard enough for furniture. A slight amount of heat, as from the body, suffices to soften it up. But most furniture may be finished with a varnish containing twice as much oil as gum, with perfect safety. However, where a varnish containing a large percentage of oil can be given plenty of time for hardening in, it will prove more durable than any harder varnish, which requires only a moderately long time for drying.—Veneers.

The Fumexer in the Finishing Room Exhaust Efficiency

An important item in the aeroning or spraying of furniture—one which has much to do with the quality of the finish, the cleanliness of the work and the health of the operator—is the removal of the fumes caused by this method of applying finishing materials.

From the first, the Aeron System has had equipment, as a part of its accessories, with which to handle the exhaust problem. This equipment, consisting of the wooden booth with a partly funnel-shaped back and an electric or belt-driven fan, proved successful, but it did not represent the ultimate efficiency yet to come.



Front view of Fumexer showing exhaust fan installation and turn-table, also air transformer set and Aeron attached.

The last word in exhaust efficiency has now made its appearance in the form of the fireproof steel Fumexer with the Autocool Electric Exhaust Fan installed. This combination not only produces the maximum in exhausting results—completely removing all noxious fumes and vapors arising from the finishing work—but, in performing this service, consumes only one-tenth or less the power that is required by ordinary exhausting methods. The service, satisfaction and saving are obvious.

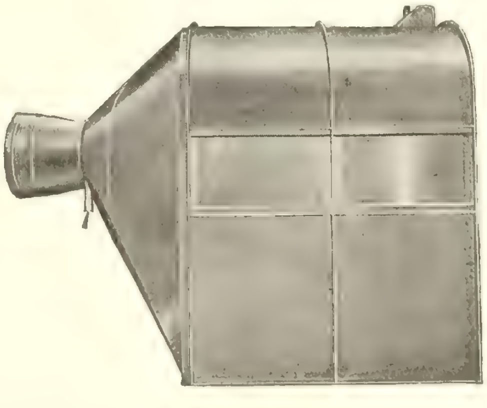
The Fumexer is made of a heavy sheet steel on a frame of angle iron, wire glass windows being built in the sides and top. From a constructional standpoint it is practically indestructible and will last indefinitely. The fact that it is fireproof will also minimize finishing room fire hazard, thereby reducing insurance rates—or, at least, keeping them down.

To provide for additional light when necessary, reflectors and sockets are built in all Fumexers—these at the top and front, throwing light directly on the work.

Another feature of Fumexer construction is the back, which is funnel-shaped clear to the floor. This style of back, together with large fan opening and arrangement, insures the height of exhausting efficiency. The short exhaust pipe running from the back opening is, as readily seen, easy to clean and permits of the placing of the Fumexer near the outside wall.

To take care of all classes of work, the Fumexer is made in a variety of sizes ranging from three feet to sixteen feet in width, with the proper number of fans installed. Other sizes to meet any special requirement are made to order.

A turn-table, which is adjustable, tilting and revolving, is supplied with the Fumexer. This device facilitates the handling of a large percentage of work. It is not fastened to the floor or to the Fumexer and it can be removed when not required.



Side view of Fumexer showing style of construction, funnel-shaped back clear to the floor and short exhaust pipe.

In passing, it is well to give a brief description of the Autocool Electric Exhaust Fan, which is a big feature of the Fumexer. The fan motor, completely enclosed and protected from fumes, is cooled auto-

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed in two days.

WRITE FOR SAMPLE

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

THE GLUE BOOK
WHAT IT CONTAINS
Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
MacLean Building, Toronto

matically by a stream of pure air which is drawn through the motor. The motor is only one-twelfth h.p.

Autocool fans are made in one size only, the number of fan units being increased for Fumexers above five feet in width. In this way the right number can easily be adapted to any kind of work. There is a big advantage in this arrangement in that a better distribution of exhaust is obtained, and the vapor is moved quickly at low pressure through the large fan openings, this accounting for the small amount of power used. One point in the construction of the fan as a great time and trouble saver is the swinging inward of the motor and blades at a 90 deg. angle with the frame. All parts are quickly and easily cleaned because of their accessibility. This style fan, which comes already installed, is a boon to the man who has little space to allot to his finishing department, as it takes up no valuable floor space, is out of the way and requires no millwright work or belting.

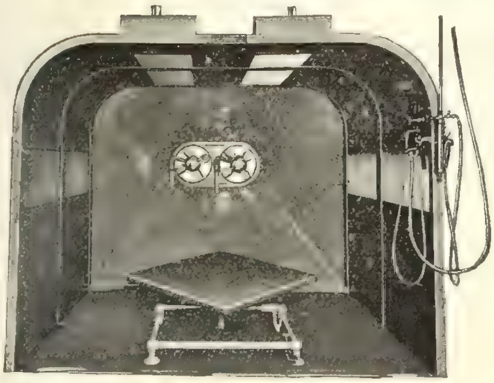
In pointing out the more prominent features and advantages of the Fumexer, the way is shown to a reliable and complete solution of the exhausting problems of furniture finishers. This Aeron System achievement has its place among the innovations and improvements which are making for the betterment of the furniture industry.

Wood-Inlay Work in India

Wood-inlay, in ivory, bone and thin brass plate, is carried on in Punjab, India. The ivory and bone work resembles the Italian intarsia, being equally effective, though less highly finished. It has been largely developed at Hoshiarpur within the last forty years, and, like the wood carving (with which it is often combined on the same piece), is now very largely exported. This "Hoshiarpur work" is an old industry of that place but up to about thirty-five years ago it had been mostly applied to the decoration of small articles, such as boxes, pen-cases, walking-sticks, and bathing pattens. Then the great development took place, and the work was applied to furniture, some handsome pieces being shown in the Lahore Exhibition of 1881-1882. The wood used is almost entirely sheeshum, though sometimes the North India ebony is used when procurable, and is very effective. Similar work is done in other parts of India where the work is as yet finer; but the Hoshiarpur work has a character of its own. It may be hoped that it will gradually improve in quality and design, if the artists and artisans are stimulated to do their best. As in the case of many other Indian art industries, however, the demand for cheap and hasty production is very harmful. The history of this inlay work in India is not at all clear. The work as practiced at Hoshiarpur may have been introduced by Italian artificers about the time of the building of the Taj Mahal, over 300 years ago. There is a tradition that Shah Abbas sent art students to Rome from Persia, and the art of intarsia, learned in Italy, may have come, like other arts, to the Punjab from Persia. It is said to have been introduced into Mysore in the time of Haider Ali. Haider Ali came originally from the Punjab and he may have brought or sent for artificers from north India. Again, in Mysore, there is an idea that intarsia was introduced into north India by Italian merchants. It seems not at all improbable that Florence, where similar work still flourishes, has been the mother city of the work, whence it has spread into the East.

Aeron System Guaranteed Paints With Air

New Steel FUMEXER (booth)



Front view of FUMEXER with Turn-table—two fan installation

With Autocool Electric Exhaust Fan Installed.

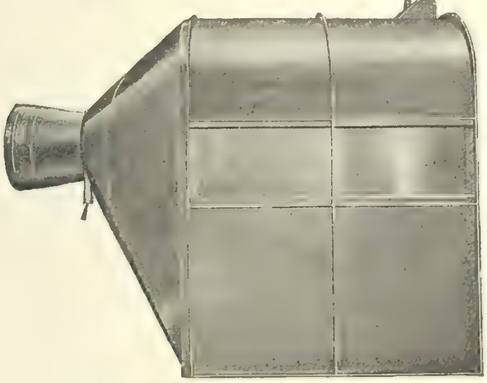
An AERON SYSTEM combination which offers the height of exhaust efficiency to your finishing room.

Here is an indestructible, fire-proof steel booth specially designed and built for service—constructed of heavy sheet steel on an angle iron frame, with wire glass windows in sides and top. (Provision is also made for electric lights when necessary—reflector and sockets are built in.)

The FUMEXER is easily installed. It will last indefinitely. It is the last word in fire-proof construction.

The back of the FUMEXER is funnel-shaped clear to the floor, giving maximum exhausting results, especially on large work. It can be placed near outside wall and short exhaust pipe run directly out-of-doors.

Furnished with the FUMEXER is the improved, adjustable, tilting and revolving Turn-table, which greatly facilitates the handling of all work. This Turn-table is not fastened to the FUMEXER or floor—it can easily be removed when necessary.



Side view of FUMEXER showing style of construction and funnel-shaped back clear to the floor

Installed In The FUMEXER Is The

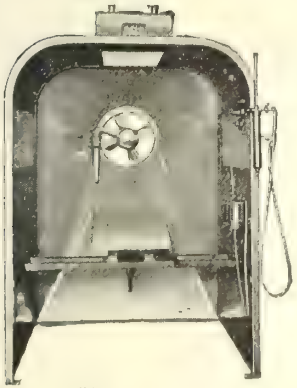
Autocool Electric Exhaust Fan

an exclusive AERON SYSTEM product, made for any current and voltage. It is an adaptation of the Ilg principle of fan motor cooling and ventilation—this means a protected and automatically cooled motor and one fully 25% more efficient than the ordinary enclosed type.

The construction of this Fan permits of the swinging inward of motor and blades at a 90° angle with frame—this means easy cleaning of blades and accessibility of all parts.

The Fan is used in small and large FUMEXERS—one in FUMEXERS up to and including 5 ft. wide, two in 6, 7 and 8 ft. FUMEXERS, and three or more for larger installations. Each Fan including motor, is a self-contained unit, and can easily be adapted to any kind of work. **The First Cost—Installed—Is Considerably Less Than That Of Any Other Style.**

The Autocool Electric Exhaust Fan requires no belts nor mill-wright work; takes up no valuable floor space; comes already installed—merely screw plug into light socket; **Will Do The Same Work As Other Style Fans With 1-10th Power Consumption.**



Single fan installation FUMEXER with Turn-table

Correctness and completeness of every part and detail accounts for the success of the AERON SYSTEM. It can do for you in your finishing room identically the same great things that it is accomplishing for hundreds of big wood and metal product manufacturers throughout the country—simply sign and mail the coupon that follows

THIS COUPON INSURES ATTENTION BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr St., Toledo, Ohio

I am interested in getting a better finish on my product at a 25 to 90% saving in time and labor—please send me catalog of the AERON SYSTEM and Accessory Equipment and complete information.

NAME ADDRESS PRODUCT

Veneers and Panels

The Manufacture of Oak Panelling

By John Hooke

THE manufacture of oak panelling is increasing year by year, chiefly because of the good machinery now employed in its production, which has caused it to be taken up by people who hitherto had regarded it quite as a luxury and correspondingly costly.

Panelling lends itself to economical production, because, after all, a panelled room is only a collection of definite units which can be readily reproduced by machinery. Many manufacturers now have three or four stock patterns, which can be made up in any desired quantity or form to suit particular rooms, halls or staircases.

The panelling illustrated in Fig. 1 has been designed to show the possibility of good panelling, simple in character, yet possessing a distinct value from an artistic standpoint. It will be seen that apart from the fireplace and window, the work is simply a multiplication of certain units, viz., pilasters and panels. The pilasters are distinctly decorative, and they serve a definite purpose from a constructive point of view, which will be discussed later.

The preliminary expenses in connection with paneling of this type are very moderate. Special cutters for the moldings must be made, and, of course, a templet or pattern for the pilasters is necessary. In addition, the machinist must have a box in order to machine-flute the pilasters, which costs only a few hours' labor, and, if moderately well made, will last for years.

The design of the panelling illustrated is based upon the work of the Elizabethan period—the five-panelled device over the fireplace, the heads of the doors, pilasters, etc., all being quite characteristic of that period. Many Elizabethan examples of panelled rooms show open fireplaces like that illustrated, the part below the mantel board usually being executed in stone, as is also the curb. A basket or dog grate, quite independent of the main structure, is usually in evidence, and forms a very effective feature when a wood fire is made.

There is a fair amount of latitude possible with regard to the fireplace in a room of this character. The stone work can be dispensed with, in which case red brick work is substituted for the fireplace or hearth, or a dog grate can be dispensed with, and a low fire, with arched opening, flush with the front, used instead. Modern grates, even, can be used, but of course, the design should be in character with the general scheme. Bright metal work is best for Tudor and Elizabethan work, but an even better effect is produced with "semi-bright" or antique finished metal work. These remarks apply also to the door and window furniture, the main idea being a fine feature of old interior work.

In Fig. 2 is indicated a suitable treatment for a

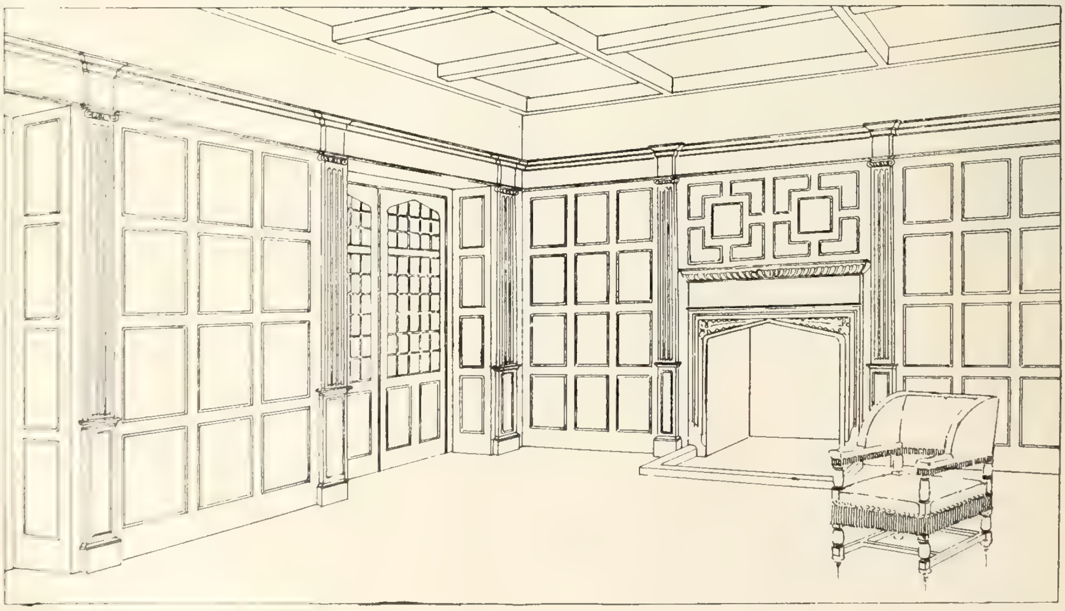


Fig. 1—Perspective sketch of part of room panelled in oak.

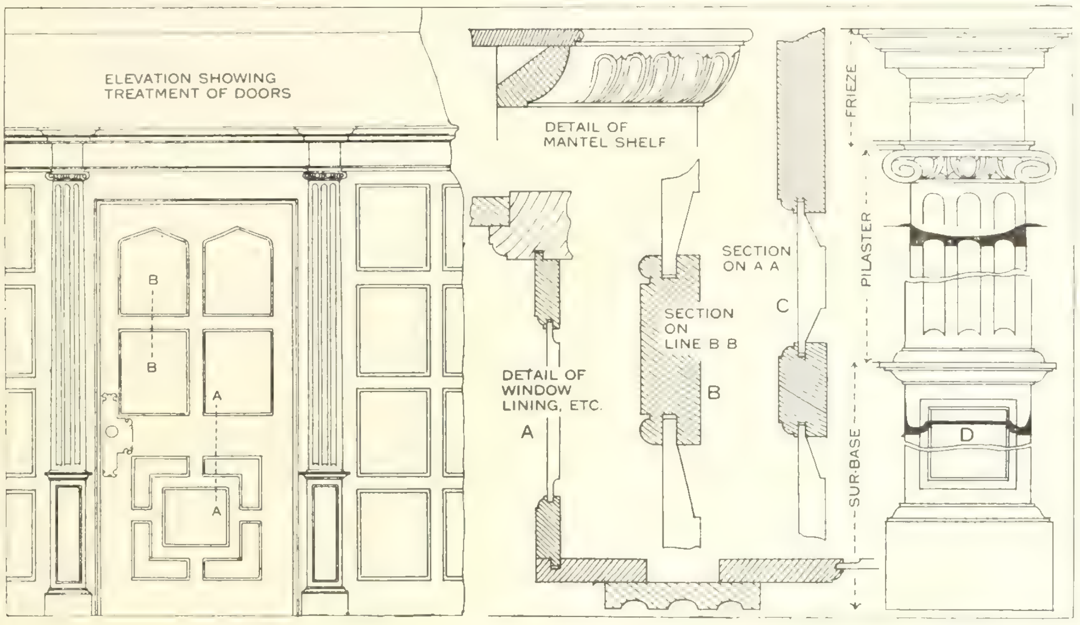


Fig. 2—Treatment of doorway and working details of panelled room.

doorway. The main features are the eight-panelled device and the top panels with Tudor arched tops. The architrave is almost entirely dispensed with, and, to form the necessary finish to the doorway, molded edges to the doorway are introduced. It should be mentioned that frequently a panelled room is introduced into a house where it is still desired to retain an existing hall treatment. The usual practice in such cases is to prepare two side-door linings and also a head lining, rebated to receive the door. That part of the interior lining between the door and the hall or corridor is then painted to correspond with the decoration of the latter.

If an architrave is introduced it is a fairly simple matter to fix the linings to the wall, the front edges coming level with the panelling, and then to miter the architrave moldings round, which effectively conceals the joints. With the treatment suggested the panelling would first be fired with bare faced tongues projecting beyond the opening. The linings are then prepared with molded edges and grooved on the inside. It will be seen that no skirting is introduced. This feature is seldom seen in early panelled work, but a narrow skirting, about two inches wide, is sometimes attached, to conceal shrinkage which may occur if the timber has not been thoroughly seasoned before use.

It will be seen from the illustration, Fig. 1, that the sections of panelling between the pilasters contain nine panels each; the number and size of the panels would, of course, vary according to the size of the room, but the main principles involved would not be affected. Part of diagram A, in Fig. 2, shows the construction of the panelling. An ovolo molding is worked on the front, or stuck "on the solid," as it is usually called, and the panels, machine-beveled as shown, are inserted before the framing is glued up. Framing of this sort is usually mortised and tenoned together, but the writer has seen many good jobs made with doweled joints.

Diagram D, Fig. 2, shows a working detail of the pilasters. These are divided into parts in order to facilitate manufacture. The surface, for instance, is cut from the solid and then grounded out and molded on the long side by machine, it being necessary to finish the top and bottom moldings by hand. The skirting is then worked in lengths and mitered round three sides, as shown. The surface moldings should simply be worked from the solid and attached to the end grain. When working the caps a pattern should be prepared to the outline indicated, which is used to mark out the number required on a board. They are then band-sawn to shape, filed to shape and carved to the design shown. A templet should also be prepared corresponding to the shape of the pilaster, which, as will be seen from the drawing, curves and diminishes towards the top.

When the pilasters have been band-sawn, the edges should be "regulated" or filed, to remove any irregularities, then planed down in order to reduce the thickness at the top. To machine the pilasters a box must be used, with which most machinists will no doubt be familiar. The purpose of the box is to enable the spindle cutter to work almost parallel to the centre of the pilaster, which would be impossible if a guide or fence was not provided. It should here be stated that the side flutes would not be quite parallel with the centre one, and it is therefore necessary to adjust the pilaster in the box so that the cutter works the flute midway between the pilaster edge and the centre flute.

The frieze would be in lengths ready for fixing, and it is a good plan to rebate this so that the proper margin will be kept when the cornice molding is fixed round the room. The sectional plan of the pilaster in diagram A, in Fig. 2, shows how this overlaps the sections of paneling. The sections would, of course, be fixed round the room first, the top edges being kept level to a line previously drawn round the walls. These sections would be fixed by screwing to the plugged walls, and then the pilasters are secret-screwed to conceal the spaces between the sections. The top edges of the panelling should be grooved so that a tongue can be inserted in the ine

The Part of Glue as an Essential Factor in Veneering

WHEN we consider that without glue there would never have been any veneering industry we can realize something of the importance of glue in the business of veneering. The term glue is meant to cover all of the cementing substances used for fastening wood together. Though glues were discovered and used in the early days of civilization and have always been a factor in joinery, yet not much importance was given this phase of the business until the built-up ply wood came into use. It was this which led to consideration and closer study of the glue side of the business.

In the earlier days of the work glue was looked upon as a mysterious foreign substance that the wood worker was not supposed to know much about except that when heated and melted and applied to wood it would hold it together. When the veneer industry had developed to the point of using enormous quantities, however, the cost of this item was such a factor that it led to a search for means of reducing it. The matter of quality came in about that time. It was found that sometimes glue failed to perform its duty and work went bad. Sometimes this was because of unwise efforts to save cost either through the use of too small a quantity or from buying an inferior glue or making up an improper mixture. Anyway, investigation of the subject soon showed two factors to consider—the factor of cost, and the factor of safety or quality.

Up to this stage of the development no one but the glue people seem to have made a careful analytical study of glue. It is doubtful if even the glue people had concentrated enough attention on the matter of careful and thorough analysis. However that may be, the veneer industry eventually created quite a stir in the matter of gluing. Important users made careful studies of the glue used. This developed appliances as well as formulas for testing and grading and heating glues.

One of the great discoveries of this period was that many people had been injuring the quality of their glue by overheating it. Experiments showed that glue could be cooked and damaged even when enclosed in a water-jacketed vessel. The experimenters soon sounded a warning against excessive temperature in preparing glue. The first ones brought it down somewhat from the original cooking temperature, and by and by these were scaled down still lower until finally there was a pretty general agreement among authorities on the subject that the temperature in the preparation of glue should be kept somewhere between 140 and 150 degrees F.

During all this time there was a more or less persistent casting about for other substances than the standard glue product to use in cementing wood together. The first outcome was the use of casein, which was taken up extensively but retired after a season or two—just why is not clear. Some say it was worth more for other purposes, others that it was uncertain. Sometimes it would give excellent results but at other times it would fail, and this uncertainty caused it to lose favor.

The casein product closely resembled in appearance and was used in practically the same manner as the regular glue, but with the passing of casein there came other products with their own peculiar methods of preparation and application, differing in some instances from that of standard glue. The most important of these, the one receiving pretty wide attention at the present time, is a product known as a vegetable glue. One of the noticeable differences between this and standard glue and its use is in that the vegetable glue can be and is commonly used cold.

This vegetable glue product has become important in veneering and is to-day probably the most formidable competitor of the old standard glue. Among the other glues are silicate of soda and some special formulas of secret compositions that seem to bear relation to what is known as the Russian idea in veneer work.

Silicate of soda or water glass is dissolved by heat, and when reduced to liquid may be kept for some time and applied cold. It is used as a principal base into which other ingredients enter in varying proportions to make up the glue mixture. There are some branches of the built-up lumber industry into which this product enters quite extensively—that of making two and three-ply stock for packing boxes and some plain panel work. It does not seem to have found favor in the furniture trade or in fine cabinet work. Just why, it is a little difficult to understand. Those who have made a study of it simply pass the subject by with saying that it serves very well for certain purposes in making cheap built-up lumber and is a comparatively inexpensive glue, but does not find favor in the finer grades of work.

What is known as the Russian method was explained at a recent meeting of veneer and panel manufacturers, but the explanation had to do more with the handling and the time of using the veneer and the qualities of the built-up product than with the nature of the composition constituting the glue. It seems that the practice in Russia is to take veneer when it is fresh and green and glue it up under pressure and heat, where it sets in a very short time, and dry it out afterward or accomplish part of the drying in the process of gluing. It seems that the glue mixture enters into the wood, replacing the sap substances or the moisture at least, and becomes in effect a waterproofing substance as well as a cement to hold the wood together. There is lacking in connection with our knowledge of this, two important things. One of these is the composition of the glue itself. We have a number of secret formulas in use in this country which suggest the Russian method, and claim waterproofing qualities, but we are lacking in definite knowledge as to the composition and nature of the material.

The other thing on which we lack information is, what is done about shrinkage when green veneer is crossed and glued up? Samples of panels claimed to have been put up by the Russian process have been examined by the writer. These seem to hold together all right and they closely resemble samples of waterproof secret process glue work that has been done in this country. In each case, however, while the glue held and the product seemed to resist moisture, there

(Continued on page 43)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

Hoffman Bros. Co.

Estab. 1867, Incor. 1904—"Nuff said"

Reg U S Pat. Off. Reg U S Pat. Off.

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods
ANY THICKNESS,
1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

– *SPECIALTY* –

Indiana Quartered Oak

Reg U S Pat Off Reg U S Pat Off

Sawed Quartered Oak Veneers

WHITE OR RED——HIGHLY FIGURED

FLAT STOCK.

Our Veneer is all dried in the latest improved Patent Dryer and as a result is absolutely flat and pliable.

W. T. THOMPSON VENEER CO., EDINBURGH, Indiana, U. S. A.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SLICED AND SAWED VENEERS

QUARTERED OAK AND MAHOGANY

We buy the best of Indiana Oak Timber and make the best grade of quartered oak Veneers put on the market.

WRITE US FOR PRICES

Central Veneer Company

Winter Ave. and Belt R.R. H. J. BARNARD, Manager **Indianapolis, Indiana**

MAHOGANY

Mexican, African, Cuban

Circassian Walnut

As direct manufacturers of Mahogany from stump to consumer we are able to offer better stock at lower prices than can be obtained elsewhere.

Ask us to have a traveller call with samples.

Lewis Thompson & Co., Inc.

Main Offices: Philadelphia, Pa.
Branches: Astoria, Long Island, N. Y. Chicago, Ill.
Canadian Representative: Rochester, N.Y. (Mr. Robert Dewart)
Carmen, Campeche, Mexico.

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

National Veneer & Lumber Co.

West Michigan Street and Belt Railroad,
Indianapolis, Ind.

We make the Best Veneers that modern equipment and a careful selection of logs can produce.

We make the lowest prices we can without sacrificing anything in quality

We want your business and know we can earn it.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in a position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - Ohio

Write for a quotation on this space—it will put you in touch with veneer manufacturers.

Goshen Veneer Co.
GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for
Poplar and Red Gum Veneers and Crossbanding

MAHOGANY VENEER—Sliced and Sawed

The wise buyer is making his selection NOW, while stocks are fairly large and the old prices prevail.

That condition will come to an end soon, for no veneer logs are coming in, and there is no certainty when shipments will be resumed.

We have Mexican and African Mahogany veneer in all thicknesses; do you care to see our samples?

HUDDLESTON-MARSH LUMBER CO.,
2256 Lumber Street
CHICAGO, ILL.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT
LUMBER AND VENEERS
American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills and Offices:
BRASFIELD, ARKANSAS

We offer for immediate shipment DRY

RED GUM
Quartered

3 cars	4/4,	1's and 2's	
2 "	5/4	"	
1 car	6/4	"	
1 "	8/4	"	
3 cars	4/4	No. 1 Com.	
1 car	5/4	"	
1 "	6/4	"	
1 "	8/4	"	
1 "	10/4	"	

RED GUM
Plain

4 cars	4/4,	1's and 2's
2 "	5/4	"
1 car	6/4	"
1 "	8/4	"
1 "	10/4	"
2 cars	4/4	No. 1 Com.
1 car	5/4	"
1 "	6/4	"
1 "	8/4	"
1 "	10/4	"

THE FAMOUS CACHE RIVER GUM
Band Sawn—Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

The Glue Book

What It Contains:

Chapter 1—Historical Notes
Chapter 2—Manufacture of Glue
Chapter 3—Testing and Grading
Chapter 4—Methods in the Glue Room
Chapter 5—Glue Room Equipment
Chapter 6—Selection of Glue

Price 50 Cents

Woodworker Publishing Co.
Limited
MacLean Building, Toronto

The Part of Glue . . . . in Veneering

(Continued from page 38)

was checking of the face, likely due to shrinkage, and from all this the tentative deduction is made that it, like the silicate of soda proposition, may be adaptable to certain work and for the purpose of making up box panels and common panels of various kinds, but not exactly the thing for fine veneering.

Here is a point where the vegetable glue differs materially from some of the others.

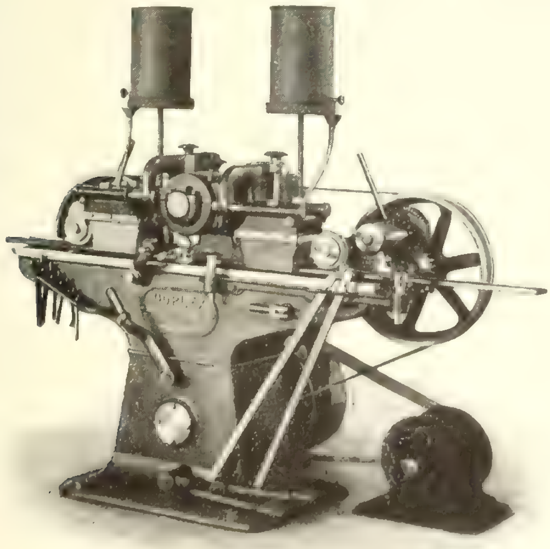
From the foregoing it will be seen that the glue side of the veneering business has been receiving a fair share of attention. The relative merits and the prospective uses of the various offerings will adjust and take care of themselves in the course of events. They deserve continued attention, too, for glue is not only a big item in the use of veneering, but is an essential factor to the life of the industry itself.

Glue plays an important part in joinery of all kinds, and in the cabinet work of to-day there is much more of the joinery held together by glue than is held by nails, screws, pins or other mechanical devices. We might devise other ways for holding frame work together in cabinet making, but when it comes to veneering the real life of the industry depends on glue. Therefore, the glue side of veneering is a vital one and it is deserving of close and continued study.—Hardwood Record.

Moulding Rubbing Machine

Finishing or hand rubbing varnished mouldings for large buildings is an expensive proposition if done properly. To begin with it requires skilled labor and then there is the uniform finish which is impossible to make by hand. The accompanying illustration shows the Duplex Moulding Sander equipped with special attachment for rubbing varnished mouldings and flats up to eight inches in width, with a continuous feed as required to finish same.

The machine can be driven from line shaft or motor, it requiring approximately 3 h.p. Owing to the compact construction, the machine is very simple to operate and erect. Several large buildings of recent date have been finished successfully with this device.



The Duplex Moulding Sander.

The machine is built by the Duplex Moulding Sander Company, Hornell, N.Y.

The Hardwood Market

THERE is little to report concerning the present market situation in hardwoods. In the presence of uncertain conditions production has naturally been reduced to a low ebb, and the prevailing sentiment among millmen in regard to present conditions is emphasized by their policy of curtailment. Notwithstanding the temporary shutting off of the European market there is abundant evidence on all sides that the situation is improving. News from across the border tends to confirm this prediction. Hardwood manufacturers in various parts of the United States are reported to be maintaining a tone of cheerfulness and confidence, believing that conditions are sound. Optimism appears to be the dimonant note, especially owing to the fact that fairly substantial orders for hardwoods are passing from time to time. Discussing the situation editorially, the American Lumberman says:—"Hardwood buying continues to be restricted to immediate requirements. Nearly all the industries are keeping their stocks down to the rate of current operation. Some increased buying is reported by furniture factories, but it is confined, as a general thing, to what is needed for current use. In this trade, as in other branches of the industry, the intention is to avoid over-stocking. A feature of the market is the report from some centres that the export business is looking up. During the last week considerable material has been shipped to European countries from New Orleans and New York. Many of the manufacturers are running on short time. The log supply is running low and many mills are down already. Some estimate that the output of southern hardwoods is not more than 10 to 15 per cent. of normal. A fairly active demand is reported for plain and quartered oak, with a satisfactory call for sap gum, which wood is moving better than red gum. The lower grades of cottonwood and gum continue to show considerable activity. Gum boxboards are comparatively scarce. Ash is slow. In the North stocks are light, and while the flooring demand is good and the sash and door factories are taking some hardwoods there is no snap to the market."

Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., October 15, 1914.—"It never rains but it pours," and furniture manufacturers and those who supply them, including lumber concerns and panel makers, are confident that when business does begin to come, it will come with a rush. Trade at present is acknowledged to be quiet: that is, below normal. This does not mean that there is no business, for though factories are running below capacity, they are nevertheless running, using lumber and veneers and shipping out furniture; and while the demand from that source is not up to the accustomed mark, it is very good for a time when starvation rations for everybody might well have been expected.

Lumber manufacturers in the States are looking to Canadian furniture men and other consumers for a lot of business during the next few months. The fact that English concerns which have been buying for export on the Continent have close relations with the Dominion ought to give furniture manufacturers there first crack at any business offering; and under the conditions a lot of it is expected to develop.

For instance, the English houses have done a good deal of business with South America. The goods have been made heretofore in England and Germany. Factories in both countries are unable to take care of the business at present, for obvious reasons, and the exporters, if they wish to retain control of the trade, must get their supplies elsewhere. North America is the natural place to look, and manufacturers in Canada and the United States are expected to make up the deficit. Enquiries regarding prices of making up large lots of furniture, pianos, organs, etc., have been received already, and providing the business can be financed, there is no reason why it should not be handled.

It must be admitted that the financial aspect of the situation is not easy to dispose of. Tight money conditions in the States are hampering plans of lumber consumers to expand in the direction of the export markets, but this may not be true to so large a degree in Canada. On both sides of the line, however, a great opportunity has presented itself; and if the bankers are able to come to the rescue and assist the manufacturers to extend the long credits which are necessary in dealing with buyers in South America, a line of business will be created which will represent a big asset for many years to come.

Then there is the immediate prospect of stimulation presented by the approach of the holidays and the harvesting of immense crops of corn and spring wheat in the United States and Canada. The farmer is certainly going to be one of the most prosperous individuals on the globe, and as it is an ill wind that blows nobody good, it is hard to begrudge the agriculturist the prosperity that is coming from war prices on food products of all kinds. And this prosperity should soon be reflected in better business for the retailers in the towns and cities all through the farming districts, so that even if trade in the manufacturing centres sloughs off somewhat on account of the large number of idle men, the purchases of the farmers should more than make up for it. Better than all, the farmer sells his goods for cash, and buys largely in the same way; and there should be a big improvement in collections with the entrance of his money into the market.

Furniture as a gift line has been emphasized more and more for several years, and stores all over the Continent ought to sell a great deal of goods during the holidays. Furniture is useful and ornamental as well, and is the ideal gift. The manufacturers should do everything in their power to co-operate with the retail trade in connection with the stimulation of Christmas business, for this will immediately react in the form of orders. In fact, it would be good business for those manufacturers who have not put much in stock to make up a good supply of the smaller numbers suitable for gifts, and push them specially, by trade advertising and otherwise, for they are likely to be caught unprepared for the repeat orders which are very likely to come unless they do this.

One of the big features at present is the Circassian walnut situation. Leading handlers recall the difficulty which was experienced in getting imports of the wood during the Russian-Japanese war ten years ago, and it is certain that the stringency will be even more marked during the present war. While there is some Circassian to be had at present, it is certain not to last long, and the problem of replacing it with something else is going to confront consumers in the immediate ly in favor of its substitution for Circassian, pointing out that there is every reason why this should be done. The American wood, like the imported, is brown, and is in keeping with the trend toward the brown woods; likewise, it is at the top of the heap in quality, and the manufacturer using American walnut could and would ask just as high a price for his goods as though he were using the imported wood. Of course, most black walnut does not possess the striking figure that is seen in Circassian, although, at that, there are possibilities in walnut, in the matter of figure, especially when thin stock is used, that were not realized by a former generation. The writer has seen some of the famous Oklahoma walnut which has as much "punch" in the matter of figure as Circassian walnut, though it must be confessed that admirers of walnut of the old school prefer it to be shown and manufactured in the quiet browns which were characteristic of its use twenty-five years ago. The supply of walnut is declared to be amply large to take care of whatever demands are made upon it, and inasmuch as the shortage of Circassian is likely to be followed by a similar scarcity of mahogany, it looks as though the logical thing would be to turn to the native woods like walnut and oak; and even gum, selected for figure, would work in well at this time.

Hardwood prices are lower than they have been for some time, and the market is weak. Quartered oak has been in fair demand, considering conditions, but prices are not stiff. Plain oak is also selling below the cost of manufacture, and few sawmill men could replace the stock they are selling at current prices and make a profit. The same is true of chestnut, which ought to be a good buy for those laying their own veneers. This is decidedly a buyer's market, although it would be inadvisable to lay in stocks for speculative purposes, in view of the uncertainties of the future. Nevertheless, the consumer who needs lumber can wisely scan the market before placing his orders, as he is pretty sure to be able to find some stock that is being offered at bargain prices.

The veneer trade long since entered the drawer bottom business, and today has practically monopolized the trade. Why not extend the use of the built-up stock to the drawer sides as well? A prominent box concern makes tobacco box sides of two-ply gum and sycamore, and the results are satisfactory enough that it suggests possibilities for extensive development in the use of two-ply stock for drawer sides. Anyway, whether it is two-ply or three-ply, the item of drawer sides is one that the makers of built-up work should give attention to and see how much trade they can develop in it.

At the recent Toronto Exhibition an exhibit which attracted the attention of woodworkers was an inlaid checker table and two chairs, made by Andrew Konecny of Toronto. The table, which is made up of 60 various kinds of wood, Canadian and foreign, was seven years in the making. Portions of copper, tin, celluloid, ivory, pearl, cocoanut and hazelnut shell, and peach stone are introduced, and 8,000 pieces of wood of countless forms and sizes are placed together by hand with the use of penknife, plane and chisel.

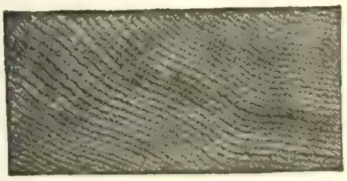
Sitting still and hoping for business may be one way of getting it, but the preferred method is getting out after it.

Printer's Ink: "Constant advertising is like a snowstorm—each individual flake comes down softly and slowly, without doing any particular stunt, until the ground is covered with a white blanket. No particular flake may attract attention, but it is impossible for anybody to ignore the results. Advertising must, of course, be backed up by the kind of goods represented, also good service and liberal and courteous treatment."

A fir tree logged by the Johnson-Dean Lumber Company, Robe, Wash., recently reached the mill of the Canyon Lumber Company at Everett, and yielded 43,420 board feet. The tree cut into four logs each 32 ft. in length. The butt log was 11 ft. 6 in. in diameter at the large end and 9 ft. 3 in. at the small end, and scaled 12,770 ft., the third section measured 6 ft. 10 in., scaling 9,980 ft., and the fourth section scaled 4,480 ft.

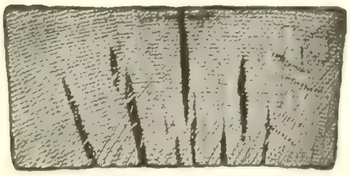
PATENTS
Herbert J. S. Dennison, Patent Attorney and Expert
Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.
Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% PROFIT SHARING
Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to
National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO



Every kind and form of
DRYING LUMBER

Grand Rapids Dry Kiln
QUALITY DRYING
Grand Rapids
Mich. - U. S. A.



PATENTS
STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) TORONTO, CAN.
The business of Manufacturers and Inventors who wish their Patents systematically taken care of is particularly solicited.
Ask for new free booklet of complete information.

NEW FACTORY FOR SALE

150 ft. x 200 ft. with 4¾ acres land, located on the outskirts of New Westminster, British Columbia, has C. P. R., G. N. R. and B. C. Electric Railway shipping facilities.

The factory is exceptionally well built and cost $45,330.00 including land. Street cars run by the grounds. There is City water and fire protection, telephones, etc.

In addition to the factory building there is an office building, chemical room and watchman's house.
This property is most suitable for a Match factory, veneer or any other wood-working business, and will bear the closest inspection.

We are instructed by the Creditors to sell this property at once, and shall be glad to consider reasonable offers. This is a snap for anyone desiring such a property.

Terms and full particulars on application.

WESTMINSTER TRUST COMPANY,
Liquidator.
DOMINION MATCH COMPANY, LIMITED,
9-10 New Westminster, B.C.

OVER 65 YEARS' EXPERIENCE
PATENTS
TRADE MARKS
DESIGNS
COPYRIGHTS &C.
Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.
Patents taken through Munn & Co. receive *special notice*, without charge, in the
Scientific American.
A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.
MUNN & Co. 363 Broadway, **New York**
Branch Office, 625 F St., Washington, D. C.

WAR —— WAR —— WAR
vitally affects the ply-wood business in foreign woods.
As it will be impossible to get further shipments for an indefinite period, we would advise our customers to select their future wants from our present Toronto stock, which is rapidly being diminished.
ALDERLITE:—
3 m/m or ⅛ in. 3-ply 60 x 40 Rotary cut, no joint, 1st quality, $26 per M. ft.
4 m/m or 3/16 in. scant 60 x 40 Rotary cut, no joint, 1st quality, $30 per M. ft.
5 m/m or 3/16 in. full 60 x 40 Rotary cut, no joint, 1st quality, $34 per M. ft.
also size 46 x 38 in 4 m/m & 5 m/m, $2 per M. ft. cheaper.
Less 7½% Trade Discount for second quality.
C. DUPRE & CO., 266-8 King Street West, TORONTO
Sole Agents, Venesta Limited, London, England

Trade Happenings and Opportunities

Woodworking News from Coast to Coast

At Ottawa the Watson Carriage Company, Limited, has been succeeded by T. H. Plant.

Mr. Geo. Foisy, of the firm of Foisy Bros., dealers in pianos, etc., died at Montreal recently.

The Great Western Furniture Company, Limited, Saskatoon, has been incorporated with a capital of $50,000.

The Warwick Wheel Company of Canada, Limited, is a new London, Ont., concern, capitalized at $100,000.

Mr. E. J. Patrick has enlarged his furniture business at Guelph, Ont., by removing into more extensive premises.

At Winnipeg, recently, the furniture warehouse of J. A. Banfield, Main Street, was destroyed by fire at a total loss of some $40,000.

The Harmony Hall Piano Company, Limited, has been incorporated with head office at Edmonton, and capital of $20,000.

The Dominion Jewel Cabinet Company, Limited, was incorporated recently with head office at Edmonton, Alta., and a capital of $125,000.

The J. D. McArthur Lumber Company's lumber mill at Lac du Bonnet (Winnipeg) Man., was destroyed by fire early this month at a loss of $125,000.

The Victoria Furniture Company, Limited, has been incorporated with a capital of $10,000. The head office of the company is situated at Victoria, B.C.

The death is reported at Meredith, N.H., of Mr. Frank Gibson, former superintendent of the Canadian Furniture Manufacturers, Limited, of Woodstock, Ont.

The Wells, Higman Company, Sault. St. Marie, Ont., have obtained a license to manufacture fruit packages and baskets. The company has a capital of $215,000.

The North Battleford Manufacturing Company's sash and door factory at North Battleford, Sask., was recently destroyed by fire, the loss amounting to $25,000.

The Durham Furniture Company has entailed a loss estimated at $2,000 to $3,000. by the destruction recently of their saw-mill at Donoch, Ont. The origin of the fire is unknown. The mill was not insured, but the lumber was partly covered.

The Nova Scotia Carriage & Motor Car Company, Halifax, N.S., has been reorganized and is now known as Nova Scotia Carriages, Limited. The company is cutting out the manufacture of motor cars and confining itself exclusively to carriages.

The Canada Furniture Manufacturers, Limited, have reopened their works at Woodstock, Ont., with a total of 150 employees on the pay roll. This has given a fillip to the industrial situation in Woodstock, indicating that the prospects are decidedly encouraging.

The Harriston Casket Company, Wiarton, Ont., are now occupying new premises which are equipped with the most modern machinery for their particular work. Last year they turned out over 4,000 caskets and they are looking forward to a greatly increased output.

Dominion and provincial entomologists who are devising means for saving the lordly trees in Stanley Park, Vancouver, from the ravages of destructive beetles and other pests, have been appealed to by the management of Vancouver Exhibition for help in getting rid of a species of saw beetle that in large numbers is attacking the timbers of the Forestry building erected only about a year ago.

The Berlin Office & Fixture Company, Limited, of Berlin, Ont., has been incorporated. The new concern has taken over the planing mill of Mr. Simeon Brubacher, which has been successfully operated for several years. The new president is Mr. Simeon Brubacher and Mr. J. H. Woolner is the secretary. In addition to the manufacture of shingles, lath and building supplies the firm will commence the making of high-grade interior fixtures.

It is not generally known that British Columbia contains some fine stands of birch timber. For this reason the provincial government has decided to include that species in the large exhibit of native woods to be made next year at the Panama Exposition. Mayor E. P. Roe, of Port Moody, was recently commissioned by the Forestry Branch to furnish a carload of birch timbers, which will be selected from a large grove in Maple Ridge district, Fraser Valley.

During an electrical storm in Winnipeg recently the electric wires in the plant occupied by the Knechtel Furniture Company, Limited, Winnipeg, were struck by lightning and fire broke out on the second floor of the building, a number of roller top desks covered with heavy paper being ignited. The flames spread until the greater part of the furniture on the floor was ablaze. The goods were largely mahogany and oak veneer, and considerable damage was effected. The total loss, estimated at between $25,000 and $30,000 is covered by insurance. The goods of the Ives Modern Bedstead Company, which occupied a section of the building, were protected from the heat of the blaze by a fire wall 18 ins. thick.

The saw mill of the St. Lawrence Pulp and Lumber Corporation, Chandler, Gaspe, P.Q., is now in operation. The company have 25 miles of railroad graded, and 15 miles of track laid, while another ten miles will be laid before the frost. There are two locomotives of the Shay type and one side rod engine of the Mogul type, and these keep the saw mill continuously furnished with logs. When the pulp mill begins operations in December or January, additional locomotives will be required. The log loaders used in the bush are the American log loaders. The cars are all steel, with 5 feet trip stakes. The pulp mill is nearing completion so far as the building is concerned, and the installation of machinery will commence next month. The company's townsite is practically finished, there being between 60 and 70 houses occupied.

¶ If you are interested in LIVE FEATURES do not overlook the Woodworker Essay Competition. The closing date of Contest No. 2 is November 30. See page 7 of this issue.

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

"Andrews" Dried Lumber
IS BETTER LUMBER

"ANDREWS" Products Represent
Perfection—Reliabilty—Results

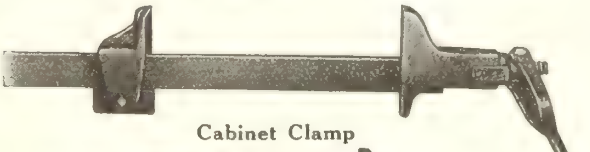
"Andrews" Moist Air Lumber Driers
CONDENSING or VENTILATED

Perfect Transfer Cars
Perfect Dry Kiln Trucks
Canvas Dry Kiln Doors
Double and Single

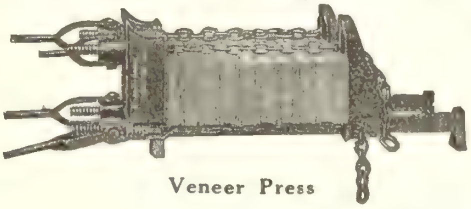
Write for Information

DRIER DEPARTMENT
The A. H. Andrews Co.
115-117 South Wabash Ave.
CHICAGO

"Pioneer" Moulding Sander
Power Veneer Presses

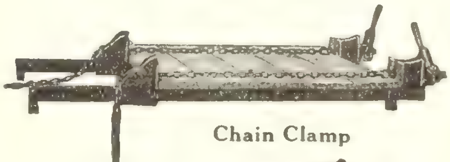


Cabinet Clamp



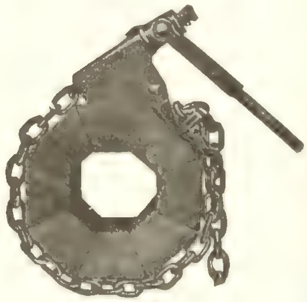
Veneer Press

Write for
Catalogue
and Prices



Chain Clamp

**Black Bros.
Machinery Co.**
Mendota, Ill.



Column Clamp

Plain Sawed Oak

Mills in West Virginia and Kentucky

Wilcox & Kuapp
Conneautville, Pa.
Quotations Cheerfully Furnished

Canadian
Hard and Soft Woods

Carefully Selected Stocks Carried
Your Enquiries Solicited

C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

The Atlantic Lumber Co.

Manufacturers and Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers - **TORONTO**
Phone Main 6386

HOME OFFICE, BOSTON, MASS.

Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Archer Lumber Company

HARDWOOD LUMBER

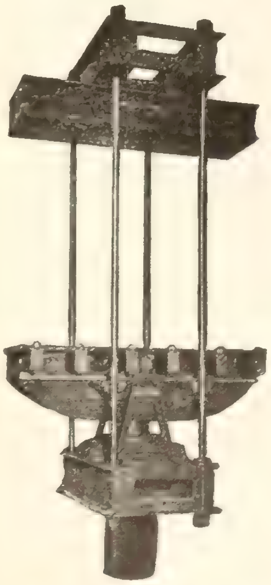
Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards 28718
4/4 18 in. and up Panel 33905

Hydraulic Veneer Press



We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

CLAMPS THAT CLAMP

We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

Send for Complete Catalogue

A. E. PALMER & SONS
OWOSSO, MICH.

INDIANA HARDWOODS

Write for a quotation on this space—
it will put you in touch with
hardwood consumers.

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

J. V. STIMSON

All kinds of

Hardwood

Lumber

MANUFACTURED

HUNTINGBURG - INDIANA

Mills at ***Owensboro, Ky.,*** and
Memphis, Tenn.

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker." They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY

Cincinnati, Ohio

OAK

4/4, 5/4, 8/4, 12/4 and 16/4 No. 1 Com. and Fas.

DIMENSION STOCK

We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT

4/4 and 6/4 all grades.

BASSWOOD

4/4 and 5/4 Log Run

YELLOW PINE

5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller Lumber & Veneer Co.

CINCINNATI -:- OHIO

Manufacturers of

Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.

CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR

Extra Wide 1, 2, 3 and 4 inch 5/8″ PANEL STOCK
6″ x 6,″ 7″ x 7″ and 8″ x 8″ Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati, O.

We Make the Best Lumber

that modern equipment and a perfect organization can produce.

Our Oak is soft in texture, even, white in color and our Quartered Oak cannot be excelled for figure.

The Mowbray & Robinson Company

"Manufacturers"

Cincinnati, Ohio

YARDS:
Chicago, Ill.
Detroit, Mich.
Rochester, N. Y.
Brooklyn, N. Y.
Cincinnati, O.

MILLS:
Quicksand, Ky.
West Irvine, Ky.
Viper, Ky.
Hombre, Ky.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO

Mills:
Kentucky Tennessee
W. Virginia

—We make a specialty of—

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chestnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Immediate Shipment

West Virginia Stock

Thoroughly Dry and Well Manufactured

1 car 4/4 1s and 2s, Plain White Oak.
4 cars 4/4 No. 1 Common Plain White Oak.
2 cars 4/4 No. 2 Common Plain White Oak.
1 car 4/4 No. 1 Common and Better Plain White Oak.
Worm holes no defect.
1 car 6/4 No. 1 Common Plain White Oak.
6 cars 4/4 S. W. Chestnut.
1 car 5/5 S. W. Chestnut.
4 cars 6/4 S. W. Chestnut.
1 car 8/4 S. W. Chestnut.
3 cars 4/4 No. 3 Common Chestnut.
1 car 4/4 No. 1 Common and Better Chestnut.
½ car 8/4 No. 1 Common and Better Chestnut.
1 car 4/4 Saps and Select Poplar.
2 cars 4/4 No. 2 Common and Better Poplar.
1 car 5/4 No. 2 Common Poplar.
1 car 6/4 No. 2 Common Poplar.
1 car 4/4 No. 2 Common and Better Birch.

We solicit your inquiries on special cut bill Oak.

Mill at Holly Junction, W. Va.

Write at once for Quotations. **The Price is Right.**

The Imperial Lumber Co.

Columbus, :-: Ohio.

DUHLMEIER BROTHERS

Mills—TENNESSEE ARKANSAS

Main Office & Yard—CINCINNATI, OHIO, U.S.A.

OAK and RED GUM

OUR SPECIALTY

Our Gum comes from Arkansas the Finest in the World—Nice Band Sawn Stock.

At our Tennessee mill we are producing some choice Band Sawn

Plain and Quartered Red and White Oak, Poplar

Mahogany

Prompt Shipments and High Grades our Hobby. **Let us quote you on your requirements.**

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

ABRASIVES
The Carborundum Co., Niagara Falls, N.Y.

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.

BAND SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Buss Machine Works, Holland, Mich.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Williams Machinery Co., A. R., Toronto.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corp., Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Williams Machinery Co., A. R., Toronto.

BAND SAW STRETCHERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Cyclone Blow Pipe Co., Chicago.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BLOW PIPING
Cyclone Blow Pipe Company, Chicago.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto.

BOX MAKERS' MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Canadian Linderman Machine Company, Woodstock, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

DUST SEPARATORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

EDGERS (Gang)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

END MATCHING MACHINE
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

EXHAUST FANS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Company, Toronto.
Sheldons Limited, Galt, Ont.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Son, Baxter D., Winchendon, Mass.

FILLERS
German-American Stain Co., Grand Rapids,
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GARNET PAPER AND CLOTH
The Carborundum Co., Niagara Falls, N.Y.

GRAINING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
National Process Co., Indianapolis, Ind.
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Adjustable Clamp Company, Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Diehl Machine Works, G. M., Wabash, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE ROOM EQUIPMENT
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS, HAND AND FOOT POWER
The Carborundum Co., Niagara Falls, N.Y.

GRINDERS (Knife)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Co., Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GRINDING WHEELS
The Carborundum Co., Niagara Falls, N.Y.

GROOVING HEADS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Pyribil Machine Co., P., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Imperial Lumber Co., Columbus, Ohia.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Kraetzer-Cured Lumber Co., Moorhead, Miss.
Mowbray & Robinson, Cincinnati.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Prendergast Co., Cincinnati, Ohio.
Shawnee Lumber Co., Cincinnati.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Talbert-Zoller Lumber & Veneer Co., Cincinnati.
Thompson & Co., Lewis, Philadelphia.
Thompson Hardwood Lumber Co., Cincinnati.
Wilcox & Knapp, Conneautville, Pa.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Canadian Linderman Co., Woodstock, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.

KNIVES (Planer and others)
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Galt Knife Co., Galt, Ont.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

MACHINE KNIVES
Berlin Machine Works, Ltd., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

MITRE MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Adjustable Clamp Co., Chicago, Ill.
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Jamieson & Company, R. C., Montreal, P.Q.
Marietta Paint & Color Co., Marietta, Ohio.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.

PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

RESAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P. Q.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SANDERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Duplex Moulding Sander Co.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SAW GUARDS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pyribil Machine Co., P., New York.

SAW GUMMERS, ALOXITE
The Carborundum Co., Niagara Falls, N.Y.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

SAW JOINTERS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Pyribil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHARPENING TOOLS
The Carborundum Co., Niagara Falls, N.Y.

SHELLAC
Jamieson & Company, R. C., Montreal, P.Q.

SHAVING COLLECTORS
Cyclone Blow Pipe Co., Chicago, Ill.
Invincible Blow Pipe Co., Toronto.
Sheldons Limited, Galt, Ont.
United States Steel Tank & Pipe Company, Chicago, Ill.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Jamieson & Co., R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Berlin Machine Works, Ltd. Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

TRIMMERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Whitney & Sons, Baxter D,, Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Can. Mach. Corp., Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Jamieson & Company, R. C., Montreal, P. Q.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

VENEERS
Acme Veneer & Lumber Co., Cincinnati, Ohio.
Central Veneer Co., Huntington, W. Virginia.
Central Veneer Company, Indianapolis, Ind.
Cincinnati Veneer Company, Cincinnati, Ohio.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dupre & Company, C., Toronto.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
National Veneer & Lumber Co., Indianapolis, Ind.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Talbot-Zoller Lumber & Veneer Company, Cincinnati, Ohio.
Thompson Veneer Co., W. T., Edinburgh, Ind.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

WORK BENCHES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

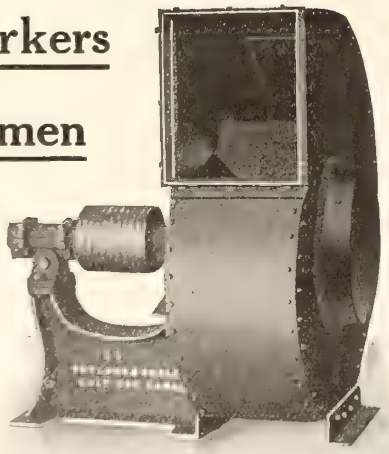
WHEELS, Grinding, Carborundum and Aloxite
The Carborundum Co., Niagara Falls, N.Y.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

WOODWORKING CUTTERS
Galt Knife Company, Galt, Ont.

YELLOW PINE
Prendergast Co., Cincinnati, Ohio.

Woodworkers
and
Lumbermen

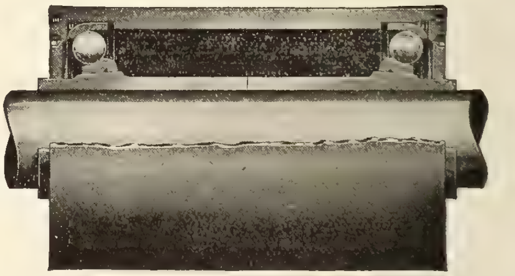


The Sheldon Exhaust Fans have characteristics that adapt themselves to the service of the Planing Mill or Woodworking Plant. They are specially designed for this kind of work, having a saving in power and speed of 25% to 40%.

Write for Industrial Booklet.

SHELDONS LIMITED - Galt, Ont.
Toronto Office, 609 Kent Building

— Agents —
Messrs. Ross & Greig, 412 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259-261 Stanley St., Winnipeg, Man.
Messrs Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.



Your Loose Pulley Trouble Disappears
when installed with
CHAPMAN BALL BEARING LOOSE PULEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The Chapman Double Ball Bearing Co. of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

ATLAS GLUE

(VEGETABLE)

SETS—STICKS—STAYS

Vegetable Glues differ as do animal glues.

Don't take any chance.

Start right—with the Atlas.

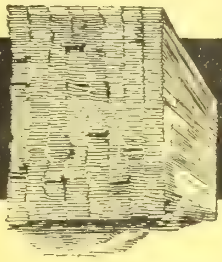
We are willing to show you.

WRITE NOW.

National Process Company

Manufacturers

Address Dept. C. Indianapolis, Indiana, U. S. A.



The Right Dry Kiln for *YOUR* Lumber

IN The Standard Moist Air Dry Kiln the drying elements are so completely under control that it's easy for the man who looks after the kiln to secure the exact drying conditions BEST suited to YOUR lumber.

Our new 64-page book, "Users of The Standard Dry Kiln and What They Say," will interest you if you are considering the purchase of new drying apparatus. We'll send it with the catalog, for the asking. Address The Standard Dry Kiln Co., 1560 McCarty Street, Indianapolis, Ind.

PERKINS
VEGETABLE GLUE

Is better than any glue made for built-up-stock and veneer laying.

It is applied without heat and does away with heat in the glue room.

It is being used by many of the largest manufacturers of high-class furniture in this country.

We can save you 20% of your present glue bills and give you better work besides.

If you are interested or doubt anything we have said, drop us a line. We will send you full particulars and give you the names of some of our customers—in the same line as you—who will be glad to give you their frank opinion.

Go into this matter right now, while you think of it.

It's worth investigating

Perkins Glue Co.

809 J.M.S. BLDG.
SOUTH BEND
INDIANA

MARIETTA
WOOD
FINISH
SPECIALISTS

FORTIFY YOURSELF

AGAINST THE FUTURE WAR SHORTAGE

by laying in a good supply of

MARIETTA

UNIFUME

and

FUMED OAK ACID STAINS

Furniture manufacturers can now get both of these items at regular prices.

UNIFUME – for evening up sap streaks, can be furnished in any quantity. Our supply of Fumed Oak Acid Stains is also adequate to take care of any reasonable demands.

We are speaking for the present, however, and cannot say how long this situation will continue.

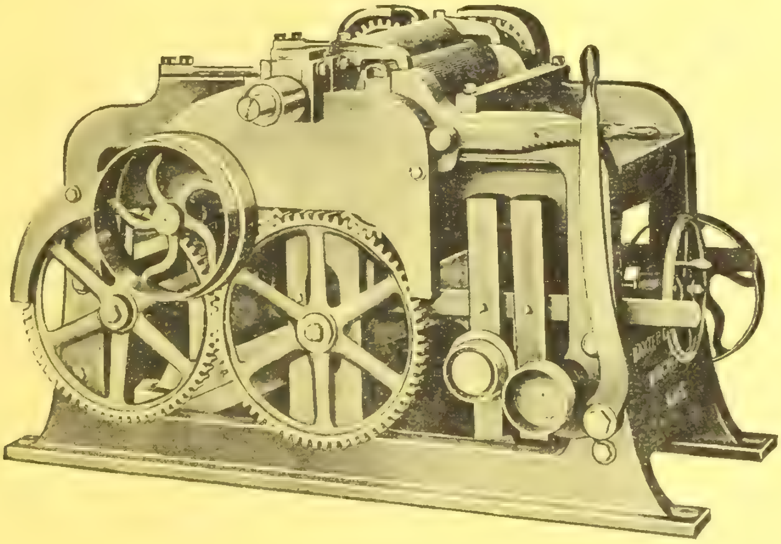
First come first served.

The Marietta Paint & Color Co.
Marietta, Ohio.

See Essay Competition, Page 7. Closing Date November 30

CANADIAN
WOODWORKER
and
Furniture Manufacturer

ANNOUNCEMENT



WE wish to announce to the Woodworking Trade that we are now exclusive Ontario and Quebec Agents for the BAXTER D. WHITNEY line of Single and Double Surfacers, Double Spindle Shapers, Wood Scraping Machines, Back Knife Gauge Lathes, and Stave Sawing Machines.

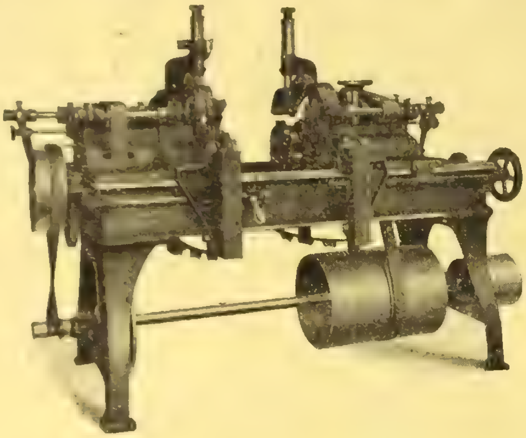
We are also agents for many other leading manufacturers of woodworking machinery.

Send your specifications and let us give you an estimate.

H. W. PETRIE, LIMITED
TORONTO, ONT.

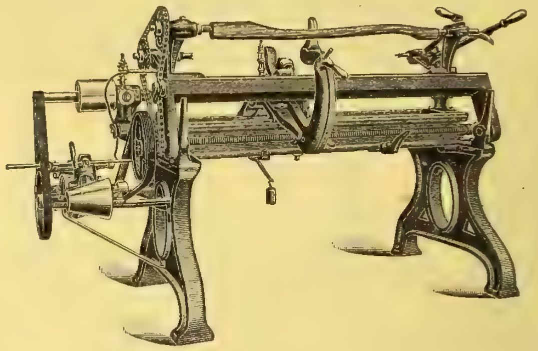
olume Fourteen TORONTO, NOVEMBER, 1914 Number Eleven

For Equalizing and Chucking a large variety of work, the New Nash Saw and Chuck Machine is very economical and efficient.



Chair Stock, Dowels, Spokes, Handles, etc.

J. M. NASH, Milwaukee, Wis.



Once **tried** always **used**

The Ober Handle Machinery

Turning Lathes, Sanders, Shapers, Rip and Cut off Saws, Bolting Saws, etc., for making handles of various kinds

Neckyokes, Spokes, Whiffletrees, Ball Bats, Table Legs, Spindles, etc.

Write for free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS, O., U. S. A.

Carborundum Brand Garnet Paper and Cloth

YOU are sanding right when you show a uniformity of finish—a saving of time—an increased production.

Carborundum Brand Garnet Paper and Cloth

Are so uniformly coated with sharp, clean grain—cut so clean and fast, show such long life that they will help you towards these ideal sanding conditions.

Glad to send working samples

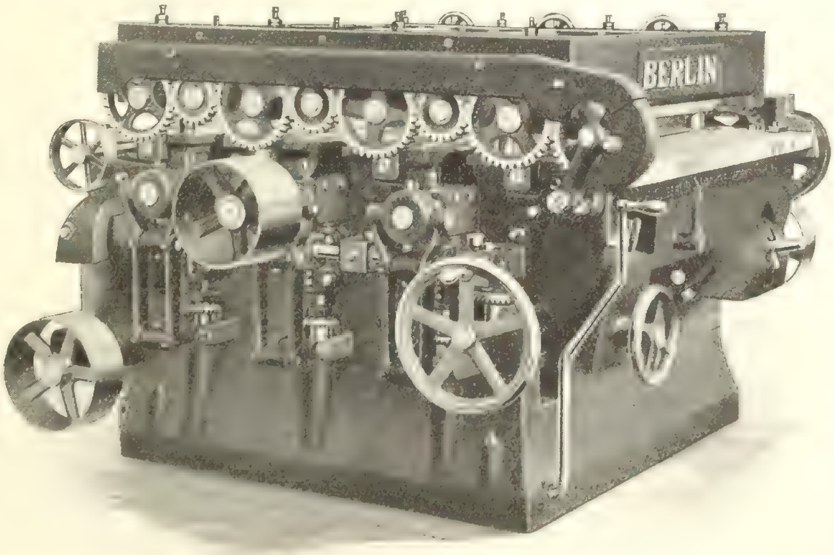
The Carborundum Company
Niagara Falls, N. Y.

New York Chicago Boston Philadelphia Cleveland
Cincinnati Grand Rapids Milwaukee Manchester, Eng.

Berlin

You Can Sand Your Long Wide Stock at Lowest Cost on a Berlin Roll Feed Sander

Other manufacturers in your line are sanding their panels, table tops and stock of similar size on Berlin Roll Feed Sanders This sander gives them the greatest amount of fine sanding at lowest possible cost. In other words, it enables them to control their costs. We began building Roll Feed Sanders thirty-three years ago. The sanders we build today are the result of all these years' of experience. On the Berlin Roll Feed Sander are patented design features and operating devices that cannot be had on any other sander ***at any price.***



Convenient Operating Devices

The drums may be adjusted separately or simultaneously with only one hand-wheel—a distinctive Berlin feature. Notice that little upright lever just below the table on the infeeding end. To start the feed simply give it one-quarter turn. A similar turn the other way reverses the feed—another distinctive Berlin feature. This assures the safety of the operator and practically eliminates damage to stock or to the sander drums, as the rolls may be reversed and stock returned before any serious damage has been done.

Two Types of Drums

Where the very finest finish is desired we recommend the Berlin patented continuous cutting spiral drum—**the drum that cuts all the time.** However, we build a straight opening type of drum with sectional automatic take-up, which is acknowledged by sander users to be the most efficient straight-opening drum on the market. This drum has a very narrow longitudinal opening and does not leave objectionable revolution marks on finished stock, as with other drums of this type.

Investigate the earning power of the Berlin Roll Feed Sander.
Mail your card request for complete data NOW—before you forget.

Berlin Machine Works, Ltd., Hamilton, Ont.

Largest Manufacturers of Woodworking Machinery in the World

U.S. Plant, With Offices - - - - Beloit, Wis.

Alphabetical List of Advertisers

Andrews Company, A. H.	43
Archer Lumber Company	44
Atlantic Lumber Company	44
Ault & Wiborg Company	32
Berlin Machine Works	3
Black Bros: Machinery Company	43
Canadian Boomer & Boschert Mfg. Co.	5
Canadian Morehead Manufacturing Company	
Carborundum Company	2
Central Veneer Company	39
Chapman Double Ball Bearing Company	50
Chicago Machinery Exchange Inc.	43
Cincinnati Veneer Company	38
Clark Veneer Company, Walter	38
Curtis Machine Corporation	6
Dennison, Herbert, J. S.	41
DeVilbiss Manufacturing Company	33
Duhlmeier Brothers	47
Duplex Moulding Sander Company	5
Dupre & Company, C.	8
Galt Knife Works	8
Goshen Veneer Company	38
Grand Rapids Hand Screw Company	6
Grand Rapids Veneer Works	41
Haughton Veneer Company	37
Hoffman Bros. Company	37
Huddleston-Marsh Company	37
Huther Bros.	5
Imperial Lumber Company	47
Invincible Blow Pipe Company	41
Kosse. Shoe & Schleyer Company	46
Kraetzer-Cured Lumber Company	
Lightfoot, Stanley	41
Marrietta Paint & Color Company	52
Meakins & Sons	32
Morton Dry Kiln Company	
Mowbray & Robinson	46
Nash, J. M.	2
National Process Company	55
National Securities Corporation	41
Ober Manufacturing Company	2
Ohio Veneer Company	37
Palmer & Sons, A. E.	44
Penrod Walnut & Veneer Company	39
Perkins Glue Company	51
Perrin & Company	44
Petrie, Limited, H. W.	1
Powell-Myers Lumber Company	45
Prendergast Company	46
Pryibil Machine Company, P.	5
Reflector & Hardware Specialty Mfg. Company	41
Robertson Manufacturing Company, P. L.	8
Scientific American	41
Shawnee Lumber Company	47
Sheldons Limited	54
Shiels & Company, Chas. F.	46
Simonds Canada Saw Company	
Spencer, C. A.	43
Standard Dry Kiln Company	51
Stimson, J. V.	45
Strong Veneer Company	6
Talbot-Zoller Lumber & Veneer Company	46
Thompson Hardwood Lumber Company	47
Whitney & Son, Baxter D.	1
Wilcox & Knapp	43

BOOKS FOR SALE

The following books are offered at special prices subject to previous sale:

Saw Fitting Manual, a treatise on the care of saws and knives. Deals with everything in the saw and knife alphabet, from adjustments to widths. 144 pages. Price $2.00.

Common-sense Handrailing, by Fred T. Hodgson. Published by Frederick J. Drake & Company, Chicago. 114 pages, illustrated. Price 50c.

Roof Framing Made Easy, by Owen B. Maginnis. Published by The Industrial Publication Company, New York. 164 pages, illustrated. Price 50c.

Handrailing Simplified, by An Experienced Architect. Published by William T. Comstock, New York, 52 pages, illustrated. Price 50c.

How to Join Mouldings; or, The Arts of Mitering and Coping, by Owen B. Maginnis. Published by William T. Comstock, New York. 72 pages, illustrated. Price 50c.

The Book of Lumber Shed Construction, by Met. L. Saley. Published by American Lumberman, Chicago. 176 pages, illustrated. Price $1.00.

Furniture Designing and Draughting, by Alvan Crocker Nye. Published by William T. Comstock, New York. 100 pages, illustrated. Price $1.00.

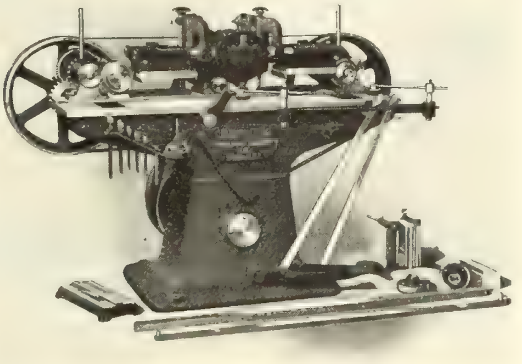
Popular Mechanics Shop Notes, Published by Popular Mechanics, Chicago. Easy Ways to do Hard Things, etc. Years 1905-1906-1907-1908. Price 40c each.

Cabinet Making, by J. H. Rudd. Published by Grand Rapids Furniture Record Company. 210 pages, illustrated. Price $1.50.

Woodworker Publishing Company, Limited
MacLean Building, Toronto, Ontario

DUPLEX MOULDING SANDER

Irregular Surface Sanding and Polishing Machine



This machine has been invented exclusively for SANDING MOULDINGS with irregular shapes and fine sharp lines at high speed and low cost.

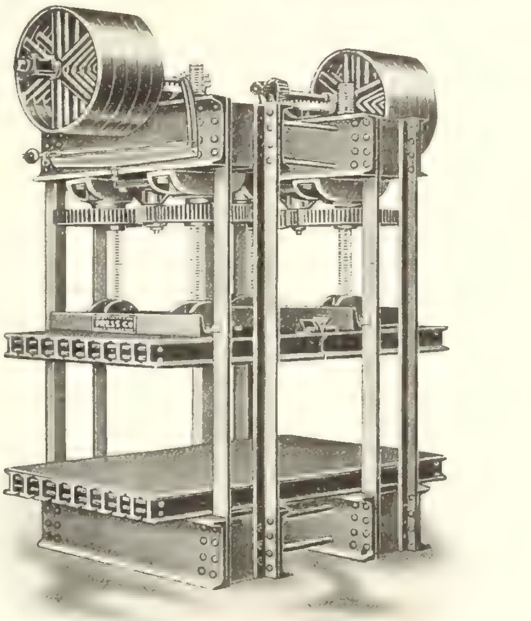
It is the only machine that will preserve the full beauty of the sharp lines. In daily use by Manufacturers of interior trim, Shipbuilders, Railway Car Builders, Furniture Factories and Musical Instrument makers in this country and abroad.

Our Belt Sanders and Double Edge Sanders are meeting with equal success.

Manufactured by

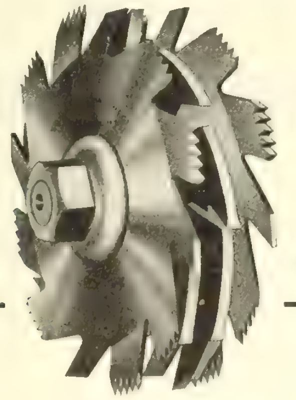
Duplex Moulding Sander Co.
Hornell, N. Y., U. S. A.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL



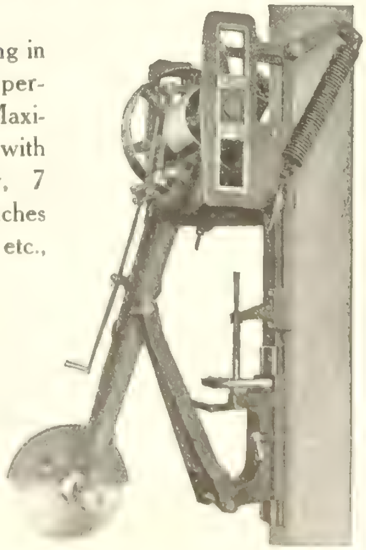
Patented Nov. 29, 1890
July 19, 1912

A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co. Toronto
Canadian Agents
Williams & Wilson Montreal

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

PRYIBIL No. 5 Parallel Saw and Groover



This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.

P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

1845-1914 Cable Address "STRONG" W.U. Code

Strong Veneer Co.

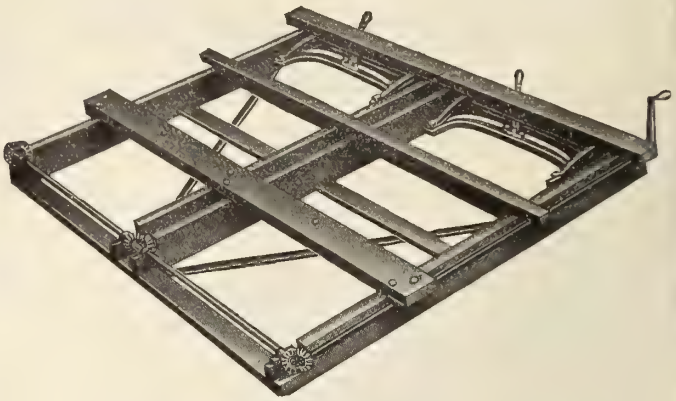
Factory and Office
Gerry, N.Y.

Branch Office and Sample Rooms
Jamestown, N.Y.

MANUFACTURERS OF

Birdseye, Curly Maple and Curly Birch Veneer, Circassian Walnut and Quartered, Figured Gum, Plain Gum, Maple and Poplar.

The Strong Veneer Co. is the oldest Rotary Veneer Company in the world. Send for samples and be assured that our Veneers are of the best in the market. Reliability is our slogan. A few samples of our line are on exhibition at the offices of the Canadian Woodworker, MacLean Building, Toronto, Canada.



GRAND RAPIDS

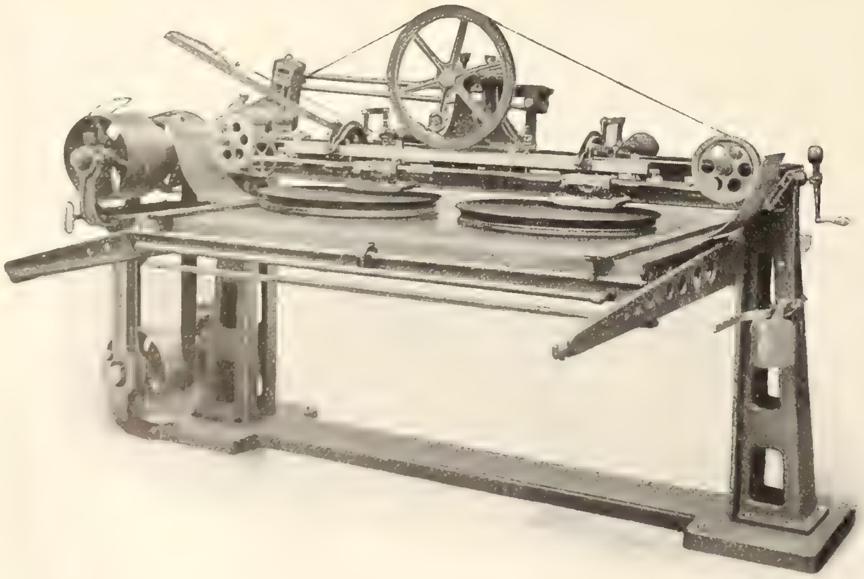
Dependable Factory Furnishings

Benches, Hand Screws, Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.

Moore Universal Rubbing Machine



The labor saving advantages of this machine are apparent in the accompaning illustration.

The action of a flexible guiding bar ensures a uniform finish throughout. Any required amount of pressure is obtained by an automatic device on the machine.

The accomodation of this machine is for cases up to 39 inches high or stock 6 feet by 8 feet.

The floor space required is 10 ft. x 10 ft. for the 8 foot machine and 10 ft. x 12 ft. for 10 foot machine.

May we send you literature?

CURTIS MACHINE CORPORATION, Jamestown, N. Y.

Essay Contest No. 2 (December)

Bi-Monthly Essay Competition

Prizes to the value of Thirty Dollars are offered by the Publishers of the Canadian Woodworker for the

Best Two Essays

on

Subjects of Practical Interest to the Trade

First Prize $20 ***Second Prize $10***

The following must be regarded as the conditions of the competition:

1.—Competitors shall be engaged in some branch of practical woodworking in the Canadian trade.

2.—The subject of the essay shall be at the selection of the competitor, preference being given to topics affording a solution to some practical problem of general interest to the trade or constituting a "short cut."

3.—Drawings (if any) may be sketched roughly, in which case they will be re-drawn at the office of the Canadian Woodworker. Preference will be given to drawings executed neatly in Indian ink.

4.—Essays shall be written or typed on one side of the paper only, leaving ample marginal space. No definite limitation shall be placed upon the articles. The suggestion of 1,000 words is given as a guide.

5.—Articles for the December issue competition must reach the Editor not later than November 30.

6.—Awards shall be made on the basis of practical interest rather than literary merit.

7.—The decision of the publishers in the matter of awards shall be final.

8.—The publishers reserve the right to publish the articles submitted.

To the Reader

The value of such competitions as an idea-getter and as a means of promoting the efficiency of the workman cannot be gainsaid. It is reflected in the many helpful, practical articles submitted in Contest No. 1.

If you held off from the first contest, get in the second. If you entered but were unsuccessful, **try again**, remembering that the secret of success in every phase of human activity is **trying again**. Practice makes perfect, and the exercise of concentration engendered now will bring results later on. The prizes are worth the winning, but whether you are successful or not you cannot fail to derive some return from the effort expended.

We are all striving for increased efficiency in the trade. If we produce better workmen, we raise the status of the industry. Let us have your co-operation. Exchange ideas. If your ideas are solid they will stand criticism; if not you should know wherein they are defective.

You know your trade well enough? Let the trade know you know it, then. It will help.

Address all communications to THE CANADIAN WOODWORKER, 345 Adelaide Street West, Toronto, marking your envelope in the lower left-hand corner, "Competition."

Gaboon Mahogany in Stock

This is an exceptionally fine grain Mahogany, three equal ply, rotary cut, both sides smooth, cabinet finish, stock is 3/16 in. full at 6½c. per ft. and sizes as follows:—

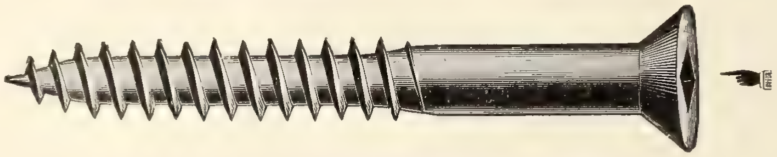
48" x 24"	60" x 24"	72" x 18"
60" x 14"	60" x 30"	72" x 24"
60" x 18"	72" x 14"	72" x 30"

This shipment has been on the way from England for months, and as it is impossible to get more we would advise promptness in placing your orders.

C. DUPRE & CO., **266-8 King Street West, TORONTO**
Sole Agents, Venesta Limited, London, England

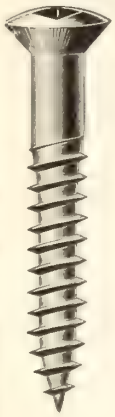
ROBERTSON SOCKET HEAD

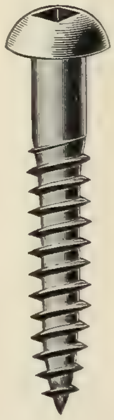
Wood Screws



See
That
Square
Hole

Pat. Feb. 2, 1909





THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited

MILTON :: ONTARIO

Good Steel, Carefully Manufactured, Scientifically Tempered

Our **GLUE JOINT CUTTERS** Make a Perfect Joint.

MILLED SHAPER CUTTERS—Any Size or Any Shape. Ask for quotations.

GALT KNIFE COMPANY, LIMITED **99 State Street, Galt, Ontario**

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring,
woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited
Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.
345 Adelaide St. West, Toronto
Phone Ade. 2700

Authorized by the Postmaster General for Canada, for transmission assecond class matter.
Entered as second class matter July 18th, 1914, at the Post Office at Buffalo, N.Y., under the Act of Congress of March 3, 1879.

Vol. 14 **November, 1914** **No. 11**

Stand Your Ground—A Word in Season

WOODWORKERS, in common with others, have their problems to meet at this time and a degree of retrenchment is what one might have expected. But nobody should commit himself to a policy of retrenchment and nothing more. Retrench by all means, but not to the extent of isolating your business in the same way that in military activities a portion of a fortress is cut off to afford a retreat. We are not retreating, we are holding our ground, and retrenchment in business holds good only in a measure.

Retrenchment does not mean any course which, adopted by the whole of a community, would result in the upheaval of sociological conditions. An employer is not called upon to turn his factory into a charitable institution, but at such a time as this he is called upon to contribute his quota towards keeping employment as nearly normal as possible. This is patriotism in one of its best forms, and we should all boast a degree of patriotism for the great Empire of which we are a humble unit.

We are not all endowed with the physical qualities which the fighting man must possess, but each one of us is capable of developing the self-sacrificing spirit of loyalty to Empire which will make him willing to devote to the welfare of his immediate community at least a fraction of the money which that immediate community has brought to his coffers during times of prosperity. This is not empty sentiment: it is the solid patriotism which we are pleased to say is being put into practice by dozens of Canada's industrial leaders—men whom the people of Canada will remember when the European war is an episode of the past.

Every woodworking employer in the country can take part in bringing about greater activity in his own factory. Furniture manufacturers, for example, can take a lead by impressing upon furniture dealers the desirability of placing their orders in Canadian factories. All employers can take contracts at a figure which will net them the bare margin of profit and provide an inducement for the dealer or owner to buy. Let it be remembered that every order placed exerts an influence for the better and that every factory placed on half-time, every workman discharged, exerts an influence for the worse.

Last year furniture valued at three million dollars was imported into Canada. Is it unreasonable to suggest that the bulk of this trade should be diverted to Canadian factories at such a time as the present? Let us get right after the home demand and corner it. The lull in the demand for wood manufactures can be only temporary, for homes must be furnished, offices and buildings must be equipped, whether eight or ten or twelve millions are engaged in war or not.

The time cannot be far distant when the "cease fire" will be sounded on the battle-fields of Europe, and it is then that those who have labored for the stability of business conditions in their immediate sphere, even at the cost of temporary discomfort or self-sacrifice, will come into their own.

The Hopeful Influence of Trade Adjustment

IT is encouraging to note that the last traces of the panic which broke out in some influential quarters at the beginning of the war are fast disappearing. In spite of the general depression of trade there is a note of optimism in the recent statements of industrial leaders, financial men and others. As far as Canada is concerned, one of the most interesting statements was made in Washington a few days ago by Sir Geo. Paish, the eminent economist, who expressed the opinion that in many ways the war would stimulate trade greatly and that the present situation would impel the United States to enlarge its operations as a money-lender. According to this authority, our neighbor to the south will have to decide whether to continue to lay additional tracks on its railroads, construct costly terminals and build beautiful buildings, or whether it will take up the task of helping to furnish capital for the world's development, and particularly for the newer countries on the American continent. Sir George points out that trade activity is a normal condition during war time and that the industries which become very active because of the war cannot fail to have a buoyant effect upon many others. So far from anticipating depression, or continued depression, next year, Sir George speaks of the possibility of a considerable trade revival, there being every promise that the embarrassment in connection with the marketing of the U. S. cotton crops—which is one of the underlying factors—will be removed. Having regard to the constructional projects of our provincial governments, municipalities and railroads, such views coming from such an authority, are reassuring.

In regard to what has been said about the impetus provided by war orders, it is not difficult to substantiate theory by fact. Quite a number of Canadian firms have fair-sized initial orders for steel shells, while contracts for barbed wire have been productive of activity in several other plants. Mr. J. H. Plummer, President of the Dominion Steel Corporation, stated in the course of a recent interview that his firm was receiving a considerable amount of new business from England. Contracts for many other lines are being withheld from Canadian manufacturers pending enquiry as to their ability to turn out the orders on time. We are told on good authority that one block of such orders is for 1,000,000 shirts, 1,000,000 pair of shoes, 1,000,000 sweater coats, 1,000,000 pair of socks and large quantities of underwear. With the award of such contracts in Canada, a wide industrial range would be affected for the better.

This readjustment of conditions is what we predicted from the first. Immediately following the declaration of war everything became disorganized and in many quarters the greatest depression prevailed. The situation was without precedent, The Kaiser loomed up as some frightful octopus whose tentacles would reach out and envelop the world. Such was the fear of God which a one-man military machine could put into the hearts of some at least of the people of the Empire. Now all this is changed, and with a further demonstration of Great Britain's slow-moving but inevitable might, confidence has been restored in a large measure and the men of little faith are joining forces with those who stood their ground from the first.

It is possible that the war may last some time, although by some optimists it is declared that next Easter will see the end of hostilities. But in any event we can afford to wait. We can hold our own and more; we can reach out after new business and get it; and when the war is over we can make up for the business which we have been obliged to sacrifice temporarily.

Are We Reaching Out for New Business?

HOWEVER strenuously in certain lines we may be pitted against United States competitors, we cannot but pay tribute to the spirit of enterprise which characterizes the people on the other side of the border.

In nearly every exchange we receive from the other side there is evidence of the manner in which manufacturers are reaching out for new business. We have before us an article setting forth the possibilities of introducing American-made pianos into Australia. Germany has imported a large number of instruments and it pointed out now that that country has struck a death-blow at her business interests abroad, boundless opportunities are opened to American manufacturers. In Australia there are no extreme conditions and the public taste is such that case design and fittings manufactured on this continent would meet the requirements of the Australian people. We are reminded that the withdrawal of German competition from the Australian field changes the entire status of the import trade in musical instruments and leaves the United States and Great Britain in possession—with all the advantages resting with the former, owing to the partial paralysis of British industries resulting from the war.

Here is surely an important branch of the trade that Canadian manufacturers might well look into. What measures, if any, have been taken to ascertain the possibilities of sending immediate shipments of furniture and pianos to Australia and other colonies, to South America and other countries? Is it good enough to pass up such opportunities? What kind of a people are we if we crawl to the centre of our web and await the coming of a fly which we know perfectly well is not the kind that is caught in a web at all?

Work as Well as Fight—"Business as Usual" in Practice

FURNITURE manufacturers and the heads of other woodworking enterprises may well take a leaf out of the book of a well-known London firm, Messrs. Veritys, Limited, who advise us that their factories are working as usual, that deliveries are normal, that prices remain unaltered and that they experience no difficulty in obtaining supplies of raw material. Further they state that in order to cope with extended business during the last few months they have had to take steps to increase their factory accommodation.

This firm set out after new business in the very teeth of depression and seized upon new opportunities with such success that while millions of men across the narrow strip of the English Channel were engaged in the world's greatest war they found the extension of their plant essential.

The example is one to be upheld throughout the length and breadth of the Empire. Devotion to business is as much the complement of military enterprise as watching is of praying.

The Standard of Merit

OPPORTUNITY is a word whose initial letter resembles more nearly than any other the emblem of infinity. The reflection bears upon the approaching opportunity of Canadian manufacturers to extend their overseas trade. This opportunity could not have been brought about for many a long year by any other medium than the war and it should be made the most of. The extent to which the circle of opportunity will enlarge must be governed appreciably by the manner in which the initial orders are executed in accordance with the specifications and requirements of the various authorities and private firms abroad.

The fundamental basis of trade expansion is efficiency. This fact cannot be impressed upon our manufacturers too strongly at the present time. Canada's place and reputation in the British Empire for the next century may depend upon the course she takes during this great conflict. It were a strange contradiction to contribute some of the best of our manhood on the one hand and on the other to condone anything like scamped work in the execution of war contracts. Such things have been done, but it is for Canada to prove herself above suspicion.

At this time it is in our best interests for the initiative to be taken by manufacturers who combine a full measure of business enterprise with an unswerving devotion to the basic principles of integrity.

A Lady Contributor to This Issue

ELSEWHERE in this issue we publish an article, "Popular Furniture of the Georgian Period," specially written for the Canadian Woodworker by Miss Margaret E. Page, of Grand Rapids. Miss Page is the only woman furniture designer in Grand Rapids, which is essentially a furniture city, and it may be ventured that she is one of very few women engaged in this distinctive line of art work and drawing for some years, Miss Page finally selected the field of furniture design and thereupon entered into competition with specialists of the other sex, of whom there are quite a number in the Grand Rapids district. She served an apprenticeship with a commercial designer and remained in his employ for professional work—so few indeed that they may be counted upon the fingers of one hand. Having studied eight years, mastering all details down to the preparation of working drawings and blue prints. Less than two years ago she went into business for herself and she is now doing very well. She has thoroughly familiarized herself with the best types of period furniture, and her designs are characterized by that distinctive refinement with which one would naturally associate a lady woodworker.

Canadian Woodworker Essay Competition

Keen Interest Evidenced in December Contest—General Approval of Conditions—A Few Additional Pointers—Last Month's Prize-Winners

(December Contest closes November 30. See Announcement page 7)

THERE is every promise of a good rally to the December Essay Contest of the Canadian Woodworker, announcement of which was made in our last issue. Now that our readers have become familiar with the terms of the competition and have had an opportunity to study the prize-winning and other articles published last month and get a line on the other fellow's work, they are casting about for words which will put their own practical ideas into black and white.

Several of our acquaintances in the trade have expressed satisfaction at the elastic conditions of the contest—conditions which enable the competitor to frame his article in his own words without too much regard to literary arrangement and also to submit rough sketches for the illustration of his ideas.

From letters received it would appear that a number of our readers have formed the impression that preference is attached to typewritten essays. It may be as well to correct this idea, for such a condition would be manifestly unfair to many practical workmen who have no access to the typewriter. Again, in more than one instance competitors have referred to "the limit of one thousand words" and expressed regret at being unable to do justice to certain phases of their subject within that compass. Here is evidence of another false impression, for the suggestion of one thousand words is intended only as a guide and not in any sense as a "limit." It must be remembered that awards are made on the basis of the most general practical value of the ideas to the trade. It might be possible to discuss a particularly helpful matter, and say all that need be said, in five hundred words, while on the other hand if an article were devoted to a more general topic, such as "Efficiency in the Veneer Room," or "Some Common Errors in Finishing Room Practice," one could scarcely do himself justice in an article of less than 1,500 words.

We mention these things because we desire to impress upon our readers that the competition is not bound up by the red tape and hard-and-fast rules which govern many similar contests that we have seen. It is necessary to lay down certain conditions, but not to adhere slavishly to detail. For instance, we ask our readers to mark their envelopes in the lower left-hand corner "Competition," but if they do not do so we do it for them. This is essentially a contest for the trade among the trade. It is designed to bring out ideas, to promote individual and general efficiency, and to establish a wider personal acquaintance among woodworkers.

Those who may be considering the competition for the first time are reminded that the subject of the Essay is left to the competitor, preference being given, as we have intimated above, to topics of the most general interest to the trade. The only thing that remains to be emphasized is the closing date, **November the thirtieth.**

We have pleasure in introducing to our readers Mr. John W. Bailey and Mr. H. W. Gould, the first and second prize-winners respectively in Contest No. 1.

Berlin Man's Success

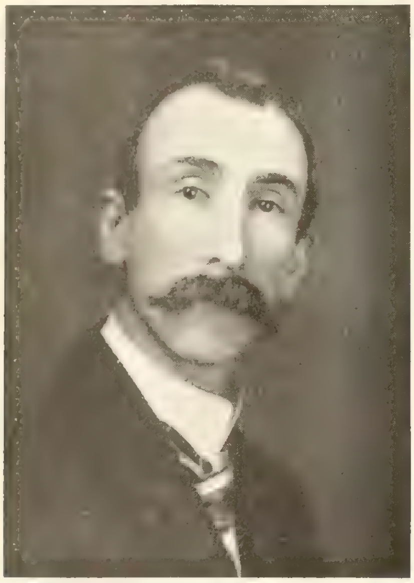
MR. John W. Bailey, of Berlin, Ont., winner of the First Prize in the October Essay Contest of the Canadian Woodworker, is a native of Northumberland County, Ont., where he was born in 1882. Educated at Campbellford, his introduction to woodworking machinery took place in an egg case factory in connection with the Northumberland Paper Mills. From his father, who was a blacksmith and a specialist in steel, he learned the fundamental principles of handling steel. Leaving Campbellford at the age of seventeen, he went to Herkimer, N.Y., where he was engaged for several years in the various furniture factories gaining an experience which has stood him in good stead ever since. He returned to Canada and entered the employment of the Canada Furniture Manufacturers as band sawyer in the factory at Guelph, Ont. A few months later he was transferred to the Wiarton plant and at the age of twenty-one assumed the foremanship of the Machine Department. After nearly three years' ser-

Mr. J. W. Bailey, of Berlin, Ont., who won the First Prize of $20 in the October Essay Contest.

vice with the company he proceeded to Ottawa, later to Berlin, and subsequently to Toronto and Woodstock. In 1912 Mr. Bailey returned to Berlin to take a financial interest in the Berlin Table Manufacturing Company, Limited, with which company he is still connected as superintendent.

Second Prize to Case Department Foreman of Clinton, Ont.

Mr. H. W. Gould, of Clinton, Ont., who was awarded the Second Prize in the October Essay Contest of the Canadian Woodworker, was born near the city of Kingston in 1872. His first connection with the woodworking industry was as an apprentice in the Case Department of the W. Doherty Organ Manufacturing Company. This might also be said to have been his last connection, for he has been with the firm (now the W. Doherty Piano Company) ever since, and he will tell you that although long out of his apprenticeship he is "still learning." Mr. Gould has seen considerable developments, both inside and outside of his immediate sphere of woodworking. He has seen the organ business with which he was originally identified develop into a large piano business and he has witnessed the passing of the bench man, who has been supplanted by labor-saving machines such as belt sanders and scrapers, hydraulic presses and machine glue spreaders. Mr. Doherty has now been foreman of the Doherty case department for eight years. He can look back over the operations of this particular branch of the industry for a period of twenty-five years, during which, as we have intimated, the work has been revolutionized. Mr. Gould confesses to a habit of being always on the look-out for pointers, and it is gratifying to know that he has been indebted to the Canadian Woodworker for not a few.



Mr. H. W. Gould, of Clinton, Ont., who won the Second Prize of $10 in the October Essay Contest.

It doesn't take much time or trouble to keep your oil cans clean, and it looks a whole lot better.

While there is admittedly a lot of waste between the tree and the finished product in wood work, it really does not reach the point of sinful magnitude as compared to other things that some would have us believe. Even the thrifty farmer wastes more of the substance of growth than the lumberman.

LETTERS

The Economic Disposal of Waste

Editor, Canadian Woodworker:—

I have read with much interest in the Question Box of the October number of the Canadian Woodworker your instructive reply dealing with the waste problem. As this is a subject which has been discussed freely in several departments of your journal of late, I desire to supply some information on the subject which to my mind should be of interest to others.

It has occurred to the writer that a scheme might be put into operation whereby those firms having large quantities of waste could combine and itemize their sizes. This information could be published in the Canadian Woodworker, by which means they are put in a position to command a saleable market. This question of finding a suitable market for waste calls to mind the case of a firm which had gone out of a special line of business requiring the use of certain sizes of lumber. The surplus stock was cut up and used for consumption in the furnace whereas the material could have been turned to commercial advantage had the company been able to find a ready market.

In a factory where I was employed I remember the question being asked the superintendent why a big wage was paid to the man who operated the cut-off saw. The superintendent's answer proved that this course taken by the firm was the best paying one in the end. Thos. Hogarth, Amherst, N.S.

Import Returns

Editor Canadian Woodworker:—

It gives me pleasure to endorse the stand you take editorially in your October issue. I agree with you that new avenues of trade are opening up and that manufacturers should consider their ground carefully at such a time as this when trade is undergoing such radical changes. Will you be so good as to publish in your next issue figures covering the principal woodworking lines imported into Canada during the last fiscal year from Germany, Austria and other countries.

J. H. Everard, Montreal.

	Germany	Austria	Other Countries
Billiard Tables	$.....	$.....	$ 103,804
Brooms and Brushes	45,276	1,604	644,135
Carriages. etc., cars, railway, parts of	6,183	......	437,888
Glue, glue stock and mucilage.	38,380	10,667	357,242
Ivories, piano keys	93,553	......	61,343
Cabinet organs, phonographs, graphophones, gramophones and finished parts thereof, including cylinders and records therefor	12,438	17,977	898,251
Pianos	9,433	......	412,647
Pianos. parts of	11,560	......	279,557
Piano and organ parts for use in Canadian manufacture .	12,485	......	103,693
Varnish, lacquers, japans, japan dryers, liquid dryers, oil finish, N.O.P.	2,066	......	3,304,864
Wood and mnfrs. of:			
Furniture	6,873	22,220	3,020,781
Other wood and manfrs. of..	47,272	3,702	13,394,119

Church Seating—Practical Notes on Recent Improvements

(**Awarded Honorable Mention in the October Essay Contest**)

By Kenneth McGilvray, Dundas, Ont.

OF late years, especially in this country, there has been a great advance in church seating, as regards style, finish and durability. The day of the plank seat is gone and no doubt in another decade the present seats will have to give way to, perhaps, tip-up chairs, a composite seat of iron and wood, or some such things, but at present the seats and furniture are almost all of wood.

The woods mostly used in the factories are—ash, oak (plain and quarter-cut), birch, maple, satin walnut, butternut, chestnut and a little of cedar. The majority of churches have ash pews, that is, seats and backs, with the ends oak; but of late years most of the larger churches are using oak all through, which costs more at first, but is the cheaper in the end, owing to its lasting qualities, its extra weight, better appearance, etc.

In making the seat itself say of ash, the wood after coming from the dry kiln is cut into 3½-inch widths, planed both sides, length about two inches more than that of finished seat required. These slats are glued one on top of another as in Fig 1A to make from 13 to 15 inches or to width of seat required, this is then planed both sides and ripped up centre by the resaw as in Fig. 1B, which gives two seats 1½-inch thick when finished. These are flat seats which are usually cushioned, but mostly they are put through the planer which has special shaped knives to hollow the centre part and form round on front edge. They are then sanded smooth by the belt sander.

In places where there hapen to be bad knots it is best to bore these out with a special bit (adjustable) which makes a clean-cut square hole. Plug up with a piece of the same colour of wood. These bits are made by Shapley, of Derby, England. The seats are then ready for the finishing room. At Fig. 1C a section of this seat is shown. They are made in any length up to 14 feet, either straight or circular, but any length over six feet should have a support, one form of which is shown (Fig. 4).

The pew backs can be made in many different forms; some of those most used are shown at Fig. 2 A.B.C. The back at (a) can be made out of the solid wood by making a 5/16-inch groove at X.X. (Fig. 2) and putting in a ¼-inch bead with glue; then bend the back with cramps till the beads are held tight and leave till hard. Another way to make the same back is in three pieces, same width glued together to shape, but a good key joint as at Fig. 2D should be used, although it is often made groove and tongue.

The back at (B) in Fig. 2 is made mostly in laminated work, 3 or 5-ply bent in forms made to the shape. If in 3-ply the board is usually split up centre by the resaw and a layer of gum wood, cross-grained, glued between the two pieces.

The back shown at (C) is flat, the easiest and cheapest to make. These backs when in place all sit at an angle of from 2½ to 4½ inches as shown at Fig. 2C which shows 3½ inches from plumb, which is very often used.

The roll at top of backs can be made to any shape, some of which are shown at Fig. 2 and are self-explanatory. They should be grooved on under side to fit into tongue formed on top edge of back as this helps to keep them straight.

The ends of the seats or pews can be made to any number of shapes or designs. They are usually made up of 2 or 3-ply of ordinary thickness as in Fig. 4A. Any cuttings from hollows in front can be used for back at top (as shown by doted lines at E-E. Fig. 3), if care is taken in marking off. The dotted lines round Fig. 3 show shape of end glued up and ready for the band saw.

These ends are then housed out 9/16-inch deep the shape of the seat and back, also shape of roll and moulding under roll as shown on Figs. 3 and 4. Allow a little more than the exact thickness to meet any variation in shape of seats or backs, and when fitting up on job the seats should be wedged up from under side as shown in Fig. 4. The backs should be wedged from back to make a tight joint at front, and check nailed top and bottom only to allow for shrinkage. In fitting up it is very seldom that the housing of ends needs to be touched as the backs will yield a little if the sharp corners are taken off to allow them to enter the housing. Very often woodworkers give themselves a great amount of extra work cutting out the housing to suit each back. A base about 2 to 3 inches thick and 1½-inches wider than the thickness of ends is nailed to the bottom as shown in Figs. 3 and 4. This allows the seat or pew when completed to be nailed down to floor of church as shown. A good filler for the woodworker I have found to be useful for fill-

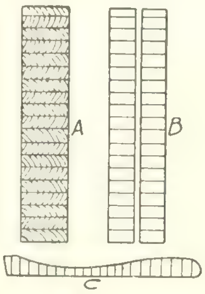


FIG. 1

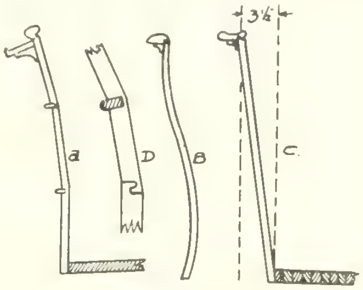


FIG. 2

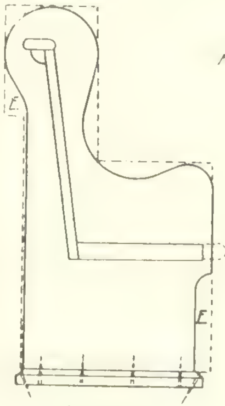


FIG. 3.

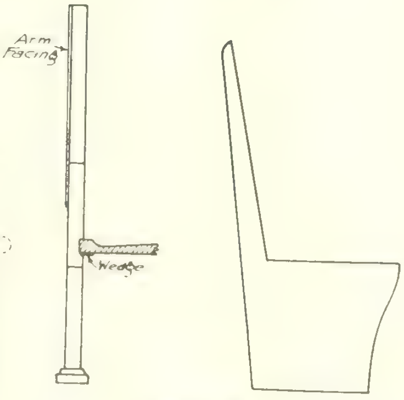


FIG. 4.

Details of church seating.

ing up any skakes, holes, or open joints in laminated work in the cabinet room, as many of these are left to the finishers to be filled up with putty, which shows up later and spoils what would otherwise be a finished job. The best filler or putty I have come across for the purpose was used by me in the ship cabinet shops on the Clyde. The recipe follows: Take some sawdust of the same wood as you are working, steep it in water for a week (it will swell a good deal in that time) then boil it for a little time, and keep beside you until wanted. It forms a kind of cake and this can be chiselled down and mixed with a little glue as required. Any holes properly filled up with this can hardly be seen or detected after the job is finished.

Another hint as to glue. One often comes across something which he wishes to get out of the cramps quickly. If a little turpentine is added to the glue it hardens much quicker and is quite as strong as usual.

How to Get the Best Work out of the Resaw

(Awarded Honorable Mention in the October Essay Contest)

By **R. J. Truax**, Chatham, Ont.

THE resaw requires a great deal of careful attention if good work is expected to be done quickly. To do this all working parts must be in good working order. There are many things which will hinder the work of a resaw. The wheels must be in line and can be tested by using a straight-edge or line placed to face of wheels as in Fig. 1.

Having wheels in perfect line we must have feed rolls in line with saw. Sufficient space should be left to enable the saw to run clear and free. Guards should never be too tight as they are liable to heat, resulting often in cracks or destruction of tension. In lining rolls, the writer generally uses a parallel straight-edge, applied one edge to saw and another to rolls as in Fig. 2. Having the face rolls in line bring others even, top and bottom, so as to bear full width of stock.

To do fast work our feed must be kept in good order; any good resaw should be capable of handling ordinary soft lumber at the rate of 75 feet per minute. To do this the saw must be running about 7,000 feet per minute for soft woods and about 6,000 feet per minute for hard woods. The saw should also be maintained at a regular speed. The writer prefers a saw with a crowning back, fully a thirty-second in five feet as saws are bound to stretch on the front edge. By having back crowning it keeps the cutting edge tighter and in addition to this there is less tendency to run.

To test tension in a saw, lay the saw on levelling bench, using the straight-edge five feet long on back. If a hollow is found expand back of saw as in Fig. 3. If a crown is found to be too much the front portion of the saw requires opening up. In both cases be careful not to take out too much tension and if a hammer is used be careful not to leave unnecessary marks. Having had the saw straightened with a uniform crown let us examine the tension. Before tensioning I usually go over a saw, levelling all lumps, being careful not to hammer when not necessary. Having attained this object I examine with a short straight-edge placed straight across the saw, starting inside of the saw, holding the gage to and raising saw, noting all fast and loose places which I will endeavour to illustrate. The centre portion (Fig. 4) being fast and tight requires opening up. It is drawn to straight-edge when saw is raised, the tight place requiring hammering or rolling on both sides of saw. If saw is to open as in Fig. 5, it is necessary to stretch the edges, being careful not to take out too much tension as illustrated in Fig. 6. The fast and loose places drop away from gage when saw is pressed down. These places require opening up. In Fig. 7 the open and loose are drawn to gage when the saw is pressed down. If too much

How to Get the Best Work out of the Resaw

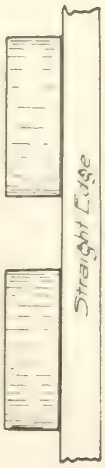


Fig. 1

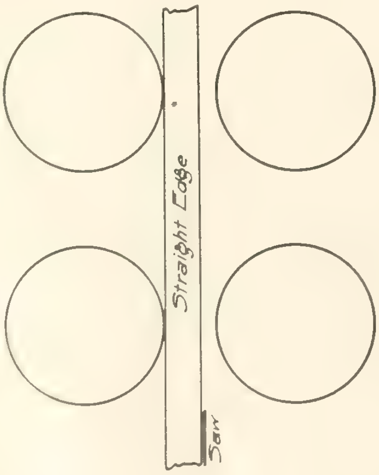


Fig. 2

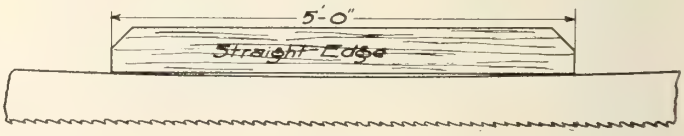
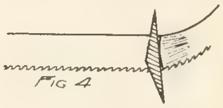
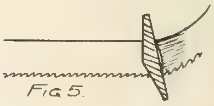
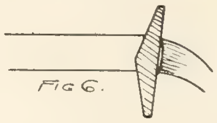
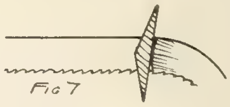


Fig. 3









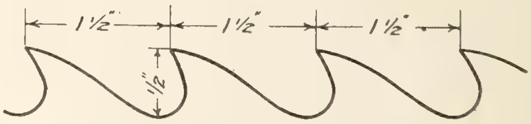


Fig. 8

tension appears the saw will require opening up on the edges. The tension should be uniform the entire length of the saw. In the opinion of the writer, a tension gage is to be preferred to a straight-edge.

Having blade in shape we next fit the teeth to the work. The writer uses plenty of hook for soft woods with an angle of 60 deg. In hard wood, however, less will work better. Teeth of 1½-in. spacing, giving plenty of room for a good-sized tooth, ½-in. long from point to throat of tooth, is to be preferred. (Fig. 8). Give saw enough swage to clear blade nicely. After swaging saw go round it with grinder before using shaper as this makes a clean shaped tooth to work upon.

In brazing a saw the writer always makes a ⅝-in. lap done with a lap grinder. If this latter is not available a file will suffice, if the operator is careful to have it straight and true so that when put together it will bear full width of point.

The writer uses irons ⅜-in. x 1¼-in., heated to a good cherry red and applied to saw after scale is removed; tightening clamps and leaving them until they turn a blueish color after which the irons are removed. The braze is then cooled so as to give it a fair temper, otherwise it will be soft. The braze is always made by the writer a trifle thinner than the body of the saw and the tension braze thinner than other part of saw. A thin braze is less liable to break than a thick one.

Care and Operation of the Three-Drum Sander

(Awarded Honorable Mention in the October Essay Competition)

By Jerome Butler, Hamilton

THE Three-Drum Sander as an instrument in the process of manufacturing furniture is not receiving the attention and consideration that it deserves. As a labor-saver it ranks high in the list of woodworking machines. Its efficiency is determined largely by the operator's knowledge of its working parts and the ability with which he can apply that knowledge. The most simply constructed three-drum sander is of necessity a complication of adjustments, and it is of the utmost importance that the operator understand the minutest details in the construction of the machine, in order that he may intelligently manipulate the various adjustments. The importance of this can be readily appreciated when one considers the fact that ninety per cent. of defective work from three-drum sanders is the fault, not of the machine itself, but of lack of knowledge and judgment on the part of the operator.

In this article I shall deal with the most prevalent defects, their cause and remedy. The most common, as also the most serious, defects may be summed up as follows: Irregular surfaces including snakes, waves and ridges; depressions on ends of stock; cutting edges and corners through on veneered work. There are other minor defects which for the most part, however, are only complications of those already mentioned.

Irregular surfaces are practically always the result of forcing the cut. It should be borne in mind that the cutting qualities of sand paper are limited and when we try to exceed that limit the results are always irregular surfaces. This is most noticeable on woods of uneven texture, such as quartered oak, the flake or figure being extremely hard and the intervening parts soft. The paper will naturally cut most where least resistance is offered. The only remedy for this is to reduce the cut to well within the limit of the cutting qualities of the paper.

What is referred to as a snake is a zig-zag mark lengthwise the stock, which may be a ridge or a depression. In the case of a ridge it may be caused by a defect in the paper or may be the result of coming in contact with some hard foreign substance, such as nails or brads in the stock which will loosen the grit from the paper, leaving a ridge. The zig-zag appearance is caused by the oscillation of the drums and the only remedy is a new paper. In the case of a depression it is usually some foreign substance such as dust or fragments between the paper and the felt, and the only remedy is to re-dress the drum, being careful to not only thoroughly brush the felts but to have the machine cleaned of dust and paper fragments.

In the matter of waves, there are two distinct kinds; one is intermittent, corresponding to the oscillation of the drums and usually the result of lost motion in the bearings. The jerking motion of the oscillation sets up a vibration which diminishes at each end of the stroke and the effect on the work is an alternate series of miniature hills and valleys. It may be successfully overcome by carefully adjusting the bearings.

The other variety of waves to which I refer are much closer together, while at regular intervals their distance apart varies as the rate of feed to the speed of the drums, there being one wave to each revolution of the drum. The depressions are very shallow—in fact can hardly be detected by passing the hand over the work—but are very conspicuous to the eye and similar to an alternate series of smooth and scratched surfaces. They are caused by the presence of loose paper on the finishing drum. This trouble is most prevalent in damp weather owing to excessive stretching of the paper when it becomes moist, but it will disappear entirely on tightening the paper.

After a newly dressed drum has been run for an hour or so the paper becomes limbered up and creates a certain amount of slack. While slack created in this way is seldom sufficient to produce the waves mentioned yet it should be taken up. It not only eliminates the danger of waves but prolongs the life of the paper.

Considerable difficulty is often experienced in overcoming dips, or depressions close to the ends of the stock. I might say it is not always depressions. In cases where the ends are raised there is an abrupt discontinuance of the cut about six or seven inches from the end. Both these defects are caused by improper adjustment at the finishing drum. When there is too much pressure on the idle roll the result is a depression. When there is insufficient pressure the result is the opposite. In the case of depression, if the feed rollers are set close to the line of the bed plates the depression will be an equal distance from the end of the stock as the edge of the bed plate is from the centre of the drum, viz., about two inches. This is sure indication that there is too much pressure on the idle roll.

When there is an excessive cut on the finishing drum and the idle roll is loose a thick end on the stock equal to the distance from the centre of the feed roll to the centre of the idle roll appears, as the feed rolls are applying the pressure instead of the idle roll. A proper adjustment of cut and pressure will eliminate both these defects. First, be sure the cut of the drum is well within the limit of the cutting qualities of the paper and remember this is a fine paper and that its cutting qualities can be easily over-estimated. Its cut should be ample to remove the scratches of the previous drum, but no more than to adjust the pressure roll until it can be held from revolving with one hand. Slightly decrease or increase the pressure until the stock shows a uniform surface. This is not difficult to obtain, but it requires a little judgment.

When trouble is experienced in cutting edges and corners through on veneered stock a re-arrangement of cut and pressure will invariably overcome it. The safest plan on veneered work is to lower the drums until they don't cut, then set the feed works tight enough to firmly hold the stock down, then start a piece through the machine and raise the coarse drum just sufficient to remove the grease from the cauls and the tape from the veneer joints. Then raise the second drum only sufficient to remove the scratches of the first drum, and the finishing drum only sufficient to remove the scratches of the second drum, and the pressure on the idle rolls no more than can be held with the hands. The results will then be as desired. It must be remembered that there is only a limited amount of stock to remove and the pressure of the feed works must be sufficient to hold the stock perfectly flat, but the cut of the drums and pressure on the idle rolls is no more than is actually required to sand the stock clean.

Practical Hints on Repairing

(Awarded Honorable Mention in the October Essay Contest)

By Robert Ferguson, Toronto

RATHER a common occurrence connected with table legs is the coming off of one or more of the castors, caused in the first place through their being fitted too loosely and all the strain being thrown on the screws in consequence. After refixing by inserting the screws into another portion of the wood, this latter gradually gets split up, until there is no more wood to screw into so that the castor is entirely without support. The best remedy for this state of affairs is to cut off the faulty part and bore a hole down the centre of the leg to the depth of 4 or 5 inches, according to the size of the table. A new piece of wood is then fitted into the castor filling the socket completely, and the remainder is reduced so that it fits into the hole bored in the leg, and on this being glued in the leg will be as strong and the castor certainly fixed more firmly than when the table was new.

If a lathe is available the new piece may, with advantage, be turned up, as a better fit is obtained in this way than by hand. One word in connection with castors when fixing as above, or renewing them. Use screws and not the ordinary wire nails that a number of people adopt for cheapness. Should the extreme end of a table leg become fractured, it is, as a rule, useless to attempt to fix the same on again. A better way to repair is to plane the leg off on the slope so as to make a straight joint, then to glue on a piece of new wood, rubbing the surplus glue out in the ordinary way of making a joint. The new piece glued on as above should be allowed to project considerably over and above the exact size, so that there is plenty to work on in cleaning off, and shaping to the desired pattern after the glue is dry.

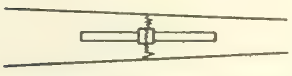
In such a splicing as this, it is best to insert a few small screws to assist the glue, sinking the heads well in and plugging the holes with wood. All screws must be inserted after the splicing is worked down to the correct shape or there will be the risk of cutting into them. For a complete fracture across the leg, (which by the way is usually caused by faulty wood, seasoned artificially), the best method of repair is to insert a dowell as shown by Fig. 1. Some care is needed to do this successfully, owing to the splintered nature of the parts and the difficulty of centering the leg properly. The former difficulty may be got over by cutting out a portion of each part in the centre, thus obtaining a solid surface from which to start the boring bit, and also to give a better chance of finding the correct centre. To be still more certain, a template may be made to fit on the leg at the broken part, with a hole in the middle to guide the boring bit in starting. For a joint of this kind to be successful, the holes must be bored in a straight line down the centre of the leg, when the two parts will come together, as they were at first, and the fracture will be hardly visible. The dowell must fit tightly, and must be of hardwood, and, if possible, pressure should be applied to bring the parts together; these being left in cramps until the glue is quite dry. When table legs give way at the upper part, where the rails are tenoned into them, they are best to be glued and cramped back into position. Then bore a couple of holes, a little back from the joint through the tenoning and insert pins which can be cleaned off flush with the leg.

The repairing of the broken chairs is one of the most unsatisfactory jobs which can be found, from the point of view of the average jobbing carpenter, and yet, at the same time, it can often be undertaken by the novice with confidence, the reason of this being that the latter has plenty of time on his hands, whereas the professional always feels that the game is not worth the candle, it being necessary in many cases to spend as much time on the repairs as would suffice to make a new one. Should the chair leg become fractured, the best way is to treat it in the same manner as the table leg previously shown.

The better class of chairs, which have a frame tenoned into the legs, are often without any stay whatever, and in consequence the legs go wrong at the top, breaking away at the tenon, or if they are dowelled to the frame the dowels are liable to become loose or break, and as the seat is as a rule upholstered over the frame and upper part of the legs, anything wrong with this part has the appearance of a big job. However, it is often possible to get over this repair in a lighter way than at first sight appears possible. Should it be the leg at fault, make another, but instead of making the mortise haunchings as usual, cut them up through as slot mortises. The new leg can then be slipped up from the bottom of the frame, and the upholstering will only need undoing at the extreme corner.

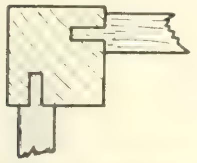
The sketch (Fig. 2) shows the top of the frame, with the leg inserted in this way. To fix it use good glue and pin the tenon as usual. Should the tenon or dowell be at fault, but the leg intact, lay the wood bare and insert screws into the frame (as shown by Fig. 3), either into the side or front rails, or both if needed, thus making a strong job again. The strengthening pieces put across the angles of chair frames are often quite useless. These should be removed and others fitted accurately, then well glued and screwed; when this is done it will add greatly to the strength and firmness of the chair.

Those chairs in which the back is fixed to the standards by a dovetail slot are often out of order, the very small dovetail being of little use against the slightest rough usage. If found to be getting loose, the situation may be saved by inserting a small screw from the back to assist the glue and dovetail, covering the head of the screw with a plug of wood. When the back has become loose, it is often impossible to use the ordinary cramp or handscrew and the amateur is often at a loss how to obtain the necessary pressure to hold the parts together till the glue is set. The best way is to use a good stout cord, which is passed over the back and under the seat, both back and front, two or three times. The pressure is increased as required by pieces of wood passed through, so as to twist the cords together, and the back is kept straight by increasing the pressure at back or front as needed.

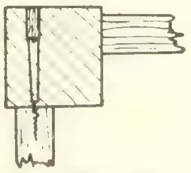


Repairing with Dowell in Case of Complete Fracture
Fig. 1.

Practical Hints on Repairing



Top of Frame with New Leg
Fig. 2



Leg Refixed to Faulty Rails
Fig. 3.

In all repairs of this kind the cords and sticks should be fixed before glueing to see how the joint goes, and when all is ready, loosen the cords again, glue the parts and refix again, which by working after this method can be done quickly—a very necessary condition where glue is concerned.

The Welcome Man

By Walt Mason

THERE'S a man in the world who is never turned down, wherever he chances to stray; he gets the glad hand in the populous town, or out where the farmers make hay; he's greeted with pleasure on deserts of sand, and deep in the aisles of the woods; wherever he goes there's the welcoming hand—he's The Man Who Delivers the Goods. The failures of life sit around and complain; the gods haven't treated them right; they've lost their umbrellas whenever there's rain, and they haven't their lanterns at night. Men tire of the failures who fill with their sighs the air of their own neighborhoods; there's one who is greeted with love-lighted eyes—he's The Man Who Delivers the Goods. One fellow is lazy, and watches the clock, and waits for the whistle to blow; and one has a hammer, with which he will knock, and one tells a story of woe; and one, if requested to travel a mile, will measure the perches and roofs; but one does his stunt with a whistle or smile—he's The Man Who Delivers the Goods. One man is afraid that he'll labor too hard—the world isn't yearning for such; and one man is always alert, on his guard, lest he put in a minute too much; and one has a grouch or a temper that's bad; and one is a creature of moods. So it's hey for the joyous and rollicking lad—for The Man Who Delivers the Goods.

Method in the Factory

A furniture factory wood-shop received boards from the lumber yard, reports a writer in September Factory. After planing, they were delivered to the swing saws for cutting to needed length. When increasing business struck the shop, the superintendent knew his cutting-off saw capacity would be crowded, so he conceived the idea of doubling or trebling capacity at that point by the expedient of piling the boards two or three high on the saw table, making one cut sever them all.

He was successful in his effort to increase the capacity, but with an unlooked-for result. After cutting, many of the small lengths of boards were seen to be unfit owing to the presence of knots. Under the old plan, cutting each board singly, there was opportunity to obtain clear lengths and to slice out each knot by two cuts close together. With the new plan, the top board hid the others.

After several days of running, the situation was discovered. The loss had been fifty dollars a day for each sawyer. Failure of this superintendent properly to check methods in view of plans for increased output caused a big loss.

The October bulletin issued by Messrs. A. H. Andrews Company, Chicago, contains much of interest to users of dry kiln trucks and transfer cars. It is pointed out that next to the dry kiln itself the apparatus for the proper and economic movement of the lumber in and about the kiln requires careful selection. A lumber truck to convey a load properly and economically must be constructed of materials strong enough to sustain the load with a safe margin, and must have wheels and axles of such dimensions and construction as will reduce the friction of the movement and cause the truck and load to roll easily, requiring a minimum amount of force for the propulsion. The design and selection of materials must be such as to insure durability under the conditions of heat, moisture and heavy service in and about a dry kiln. These vital points have received special consideration in the "Andrews" trucks and transfers. The construction of the wheels, roller bearings and side beams of the Andrews product are described in detail in this bulletin, which will repay careful perusal.

Keeping a factory clean or letting it go foul is more a matter of habit than anything else. Get the right habit here and you will find that it neither takes more time nor costs more money to keep things clean and in good order, than it does to just let them go.

The annual meeting of the Hardwood Manufacturers' Association will be held at the Hotel Sinton, Cincinnati, January 28-29 next. It is expected that the consuming manufacturer will be present in force this year, a special invitation having been extended.

Popular Furniture of the Georgian Period, and Its Designers

Specially contributed by Margaret E. Page, Grand Rapids, Mich.

BY the Georgian Period is meant the years embracing the reigns of George I, II and III of England. Marked changes took place during this evolution of time, which dates from 1714 to 1820. Furniture, like architecture and costumes, was transformed from the heavy over-ornate, to the simple outline and classically decorated product.

Of all the designers who made themselves known during this period, Thomas Chippendale stamped his personality on furniture-making in such a manner as to bring him lasting fame, hence the writer feels justified in giving this celebrated designer and his works first consideration.

Chippendale is generally supposed to have been born in Worcester about the year 1710. In 1754, as became the custom for all progressive architects and designers, he published a catalogue of his designs, which he called "The Gentleman's and Cabinet Maker's Director," and which proved a very successful publication.

Margaret E. Page.

He was pre-eminently a carver, and rather an adapter than a creator. While some of his earliest pieces were criticized as being over-loaded with ornament, especially his designs showing the French rococo influence, it was under his skilful hand that later the beauty and simplicity of classic models were again proven. The chair in the foreground of the accompanying illustration shows a pure Chippendale chair, having the cabriole legs and the claw and ball foot which he used so much on his more solid chairs and settees. This leg, which originally was taken from the Dutch, was much in prominence during the preceding reign of Queen Anne. The seats of these more substantial chairs were roomy to accommodate the ladies' hoops and the skirt-coats then in vogue. The chairs were mostly made armless, which was quite necessary to their comfort.

Among the two hundred designs shown in his "Director" were a great many known as "Chinese Taste." This Chinese influence seemed to meet with the approval of everyone, contrary to the Gothic modification which Chippendale also used and which was the least enduring of any of the styles adopted by him. The tabourette, shown in the illustration, is a good example of the Gothic used, although he more often used it in such places as the doors of cabinets and tops of book-cases.

His designs showing Chinese fret-work are commonly reproduced, therefore familiar to most of us. Chippendale worked in mahogany and rose-wood and some of his most elaborately carved designs were embellished with gilt also, while others were mounted with richly chased brass, copper and silver. The fashionable ailment of the day was gout and we find designs for gouty-stools on which the tops could be raised or lowered to suit the patient. Among the other novelties designed by him were wine-coolers, tea-tables, card-tables and candle-stands as he called them. Many tea-tables made their way to America, where, on account of the extortionate price of tea, which was selling for thirty shillings a pound, tea-drinking had become very fashionable. Many of these tables had standing rims of delicately carved fret-work, which were intended to protect the china. A few examples of such tables are preserved in the collection at Memorial Hall, Philadelphia.

By the reign of Geo. II card-playing had become very popular. Not to play cards was considered ignorant. This led Chippendale to conceive many ideas for convenient tables, as every house had at least one card-table. Gambling became prevalent, and Princess Amelia Sophia, daughter of George II, was an inveterate snuff-taker as well as gambler. Even in America gambling was said to be a favorite diversion, on the great plantations of the South.

Chippendale furniture is easily recognized. The ball and claw foot and the cabriole leg, which he used so freely before he introduced the straight leg, are decisive characteristics. The chair-backs are quite distinctive, whether the splats run up and down or across. The top is generally extended on each end. He never used inlay. In his very ornate carvings he used the long-billed bird, the falling water effect and the familiar ribbon-work very frequently on chair-backs with good effect. The front-bar of the seat of some of his chairs often had a shell carved on it. When the seats were stuffed the covering, which often was hand-embroidered, was usually drawn over the rails and adorned with gilt-headed nails, sometimes set in a pattern.

Chippendale was better known than any of his contemporaries. To this, doubtless, is due the fact that for the last thirty years, since it became the fashion to collect furniture, every cabinet, table or mirror-frame presumably of English manufacture is dubbed "Chippendale."

We will now turn our attention to his less popular contemporaries, which included Adam Bros., Hepplewhite, Shearer and Sheraton. As the increased market grew more prosperous more cabinet-makers were produced, who worked in a different style to that of Chippendale and made much very handsome furniture.

Robert and James Adam, who were architects by profession, turned their attention to furniture. Their designs were all on classic lines, many of which were painted by such celebrated artists of the day as Pergolese, Zucchi and Angelica Kauffmann. The Adam Brothers were Scotchmen, Robert having been born in Kirkaldy in the year 1728 and educated at Edinburgh University. In 1754, after the discovery of Pompeii, Robert visited Italy and was influenced by the classic arts revived by the excavations of the long-buried Roman cities.

In 1764 he published his book, which he dedicated to George III. For this he was appointed architect to the king and his rise thereafter was rapid and brilliant. In 1778 his entire works were published under the title of "Works in Architecture, by Robert and James Adam, Esquires." His pieces were never overloaded with ornament and he showed wonderful skill in adapting classic forms to modern taste. No slight detail escaped his notice and he drew patterns for the material covering his furniture, even to the little silk cushions on the arms of the chairs.

Composition-carvings were introduced by Adam, which were usually low in relief. The classic urn, ram's head, and daisy pattern, by which the style is readily distinguished, were commonly used. This style has been successfully reproduced during the past four or five years and will continue to be popular. The fluted leg, terminating in a spade-foot, is another characteristic. The fluted vase-shaped leg having the tapered block foot was also very popularly used, while the garrya-pendant combination of the ram's head and garraya sway and the cloven-hoof, might also be mentioned as characteristics. A good example of these ornaments is shown in the vase-stands in the illustration.

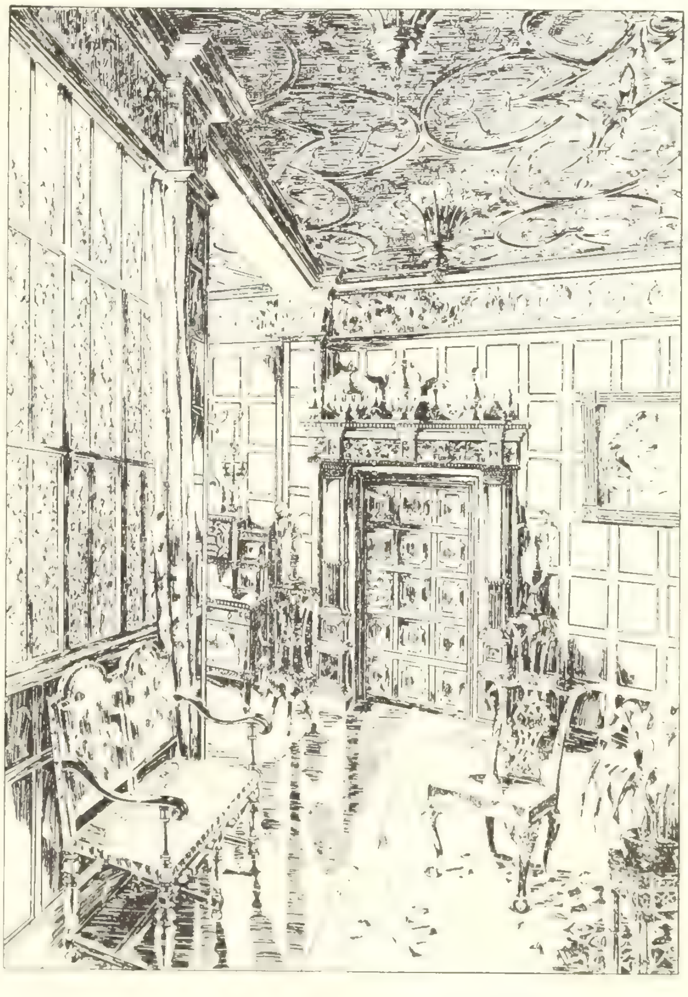
Although the name of Thomas Shearer is not often heard in connection with the styles, he published a book in 1778 called "The London Cabinet Maker's Book of Prices," which contained many beautiful designs. To him we are indebted for that useful article, the side-board, Chippendale having made only a side-table.

Shearer and Hepplewhite, while worthy of much cerdit for their ability in designing, never approached in popularity, Chippendale nor Sheraton, their successors.

A. Hepplewhite published in 1789 a book, "The Cabinet Maker's and Upholsterer's Guide," in which were many attractive designs. His chairs were extremely pretty and are by no means uncommonly reproduced at present, although the modern product is more substantial in construction. In fact Hepplewhite made his chairs so fragile that they were easily broken. The circular and shield-shaped backs were almost always used, the splat seldom being carried down to the seat. The Royal plume within the shield or drooping ears of wheat drape, and husk pattern were common devices of Hepplewhite. He used inlay to notable extent. His tables and side-boards having the slender, tapering, inlaid leg, are often called by the name of the great designer who succeeded him. One noticeable difference between his inlay designs and those of Sheraton, however, was that Heppelwhite's were disconnected, while Sheraton worked more in line. Hepplewhite showed a great preference for the circle or a portion of it. His small tables are nearly always round, his side-board tops often in the form of the half-circle.

Fashion changed and with it furniture. No longer did they wear hoops and farthingales, so chairs were made small and narrow. Hepplewhite made much comfortable, stuffed furniture. The tall high-backed easy chairs with "cheek pieces" were well calculated to afford protection from draughts. This idea distinguishes the present-day fire-side chair. His knife-boxes, which articles were also designed by Adam, were most elegant, especially when in the urn shape, with a rod in the centre to prevent the top from being removed.

Sheraton, the last of the Georgian Period designers, profited much by the designs of his predecessors. He was most frankly pleased with his own skill and discredited all others. The legs of his pieces were very much like those made by Hepplewhite and he also preferred inlay to carved ornamentation, although he sometimes used them in low relief, not letting them interfere with the outline. He ornamented construction rather than constructed ornament. He is really deserving of much credit for the fine proportions, simple shapes and structural beauty of his early designs.


Early Georgian Interior. Sketched by Miss Page.

After 1793 Sheraton made little furniture but gave his time chiefly to writing his furniture books. In 1791 he published "The Cabinet Maker's and Upholsterer's Drawing Book," this being followed by several others which were not all completed till 1807.

Glue will do its primary setting in a few hours and sometimes in a few minutes, but the final hardening and drying out of glued stock requires time enough for the moisture to be taken up and passed off. Therefore, it is well to keep glued work clamped up for a day or two, then carefully piled for a week or two to keep it straight.

A Few Cabinet-Work Details in Modern Bedroom Furniture

By Paul D. Otter

EVERYTHING which adds to our comfort—assisting in our daily process of refinement—is certainly to be welcomed and the few bedroom accessories which are here to be considered should not be considered as more of vanity's machinery, but rather as furniture forms for the bedroom which meet the needs of the more modern exaction of the toilet. The open character of the present-day furniture appeals to the orderly sense of the housewife, as it has recently from a cleanly reason appealed to the office man in the introduction of the so-called "sanitary desk" and other large articles of furniture which formerly were the means of harboring so much dust under the low-built structure.

It will be noticed that the dressing tables shown in Figs. 1 and 2 are quite approachable affairs from their open character, and greater comfort and deliberation are to be given the hair dressing and other toilet operations by the use of the type of chair shown in front of the table in Fig. 2, which is distinguished from other chairs by the low back and different height of seat.

The construction of the articles shown in Figs. 1 and 2 is obviously apparent and it is only necessary to call attention to the almost invariable use of what will hereafter be referred to as a "construction frame" illustrated in Fig. 3. The outer size of this is determined on the detail drawing, for be it known that the carpenter should lay out some sort of drawing showing at least half of the length and width of the article. In this case the plan is determined by the size of the top, which is 20 x 34 in. Now in the drawing 20 x 17 in. is sufficient to put in all needed detail of half the construction for purposes of location of posts, which in this and usual cases should set in ⅜ to ¾ in. Then proceed to draw in on the half plan the position of the ¾-in. side and back rails, together with the drawer front, which is also ¾ in. thick. The rails should set in from the face of the posts ⅛ of an inch.

Having made this part of the plan, it will be easy to draw in this structural detail suggested in Fig. 3, the thickness for the ordinary case work for this frame being ¾ in. and the width of both stiles and rails 2 or 2½ in. Such a frame is usually jointed with dowel pins, and the corners to receive the posts cut out after the frame is made up, as indicated in Fig. 3. Here, again, as frequently happens, the front part of the frame is exposed to view, as will be noted under the drawer in Fig. 2, and this part of the frame must be of the same wood as the entire construction. Usually when it is not in view the frame is of basswood.

The "construction frame" is a means not only of giving a stiff construction, but also affording a place to secure sliding strips of a harder material upon which the drawers are to slide. The turned form of leg and mirror pillar shown to the right in Fig. 1 is offered as equally appropriate if the plain post is not desired.

Fig. 2 has the added attraction of the swinging side mirrors, so much desired in dressing the hair. A certain delicate character and finish should be given to the making of these mirror frames and material of ⅞ in. thick and having a finished width of 1⅛ in. will make

Cabinet-Work Details in making
Bedroom Furniture.

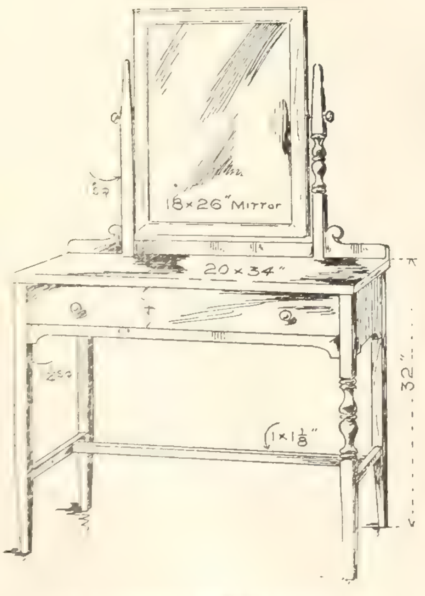
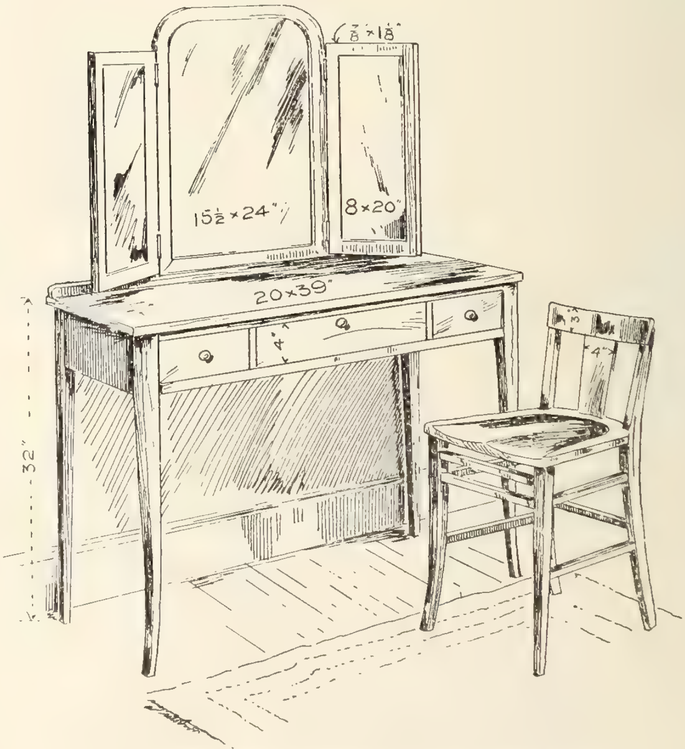


Fig. 1—General View of Toilet Table



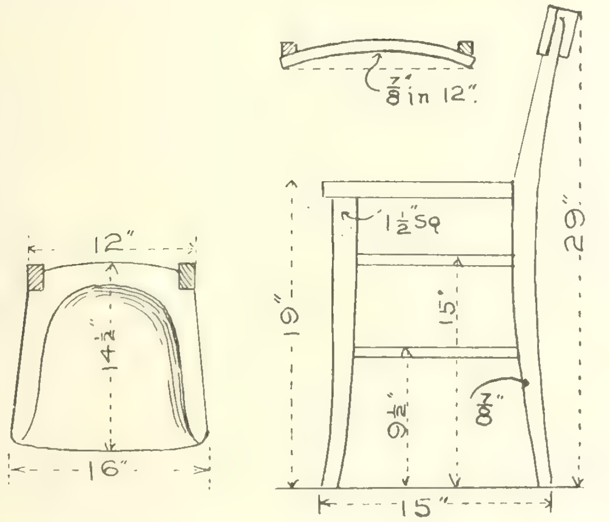
2—A Toilet Table or Dresser and Its Low Back Chair frames amply strong, yet light in appearance. Make the rabbet for the glass ½ in. deep and treat the face of frame to a low round shape. Cover back of framing with ⅛ in. paneling or veneer, neatly secured with round head brads. As thin stock is hard to secure, a certain quality of hard-pressed straw board is being used very generally for such purposes. The middle mirror is held and stiffened by two cleat strips screwed firmly to the frame and to the back rail of the table. Material dressed to a thickness of ¾ or 3/16 of an inch is universally used for most all forms of furniture, while post stock for the lighter carcases is secured from 1¾ to 2-in. squares, which when reduced to a finished size generally measure 1½ to 1¾ in. respectively. This allows for roughness or squaring up of other imperfections. The posts in Fig. 2 are dressed to a square of 1½ in. at the top and reduced to a curved taper of ⅞ in. at floor.

As to the chair shown in Figs. 2, 4 and 5, it is a distinct part of the table, and when not in use it is placed directly under the table out of the way. When in use the low back affords sufficient back support, yet does not retard the use of the arms in dressing the hair—considerations which give these two pieces of furniture growing popularity among women. As the back posts of this chair are secured from a ⅞-in. board 2½ in. wide, sawed to a pattern made from shape indicated, it will not be a difficult chair to make as the two posts are screwed to the seat in a vertical outside width of 12 in. and square to the front.

The curved and tapering front legs are obtained from 1½ in. square stock and are secured by two dowels each to the under side of the seat, having an outside width of 15¼ in. The stretchers are ¾ in. square.

The seat is of a solid or jointed board dressed to a thickness of 1⅛ in. and hollowed out in the deepest part to ⅝ in., forming the saddle effect indicated.

The top slat may be secured by using a draw-knife and spoke shave in producing an even sweep of ⅞ in. in depth in its length of 13 in., and by a pattern or tem-



Figs. 4 and 5.—Details of Toilet Table Chair Shown in Fig. 2

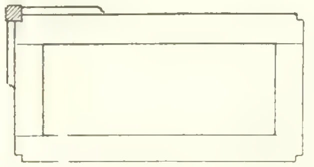


Fig. 3—Plan of Construction Frame

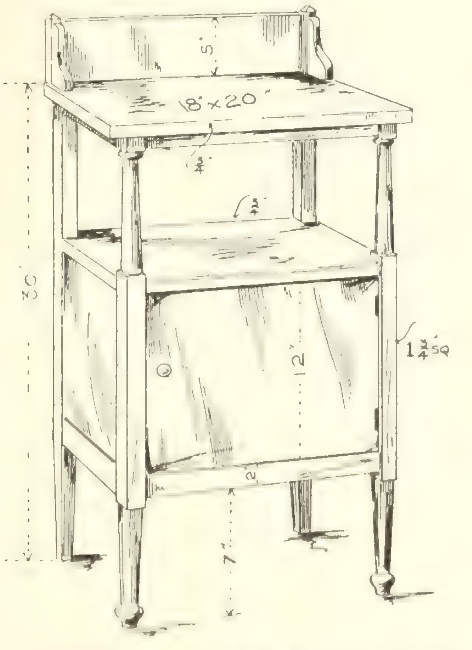


Fig. 7—General View of Wash Stand and Somnoe

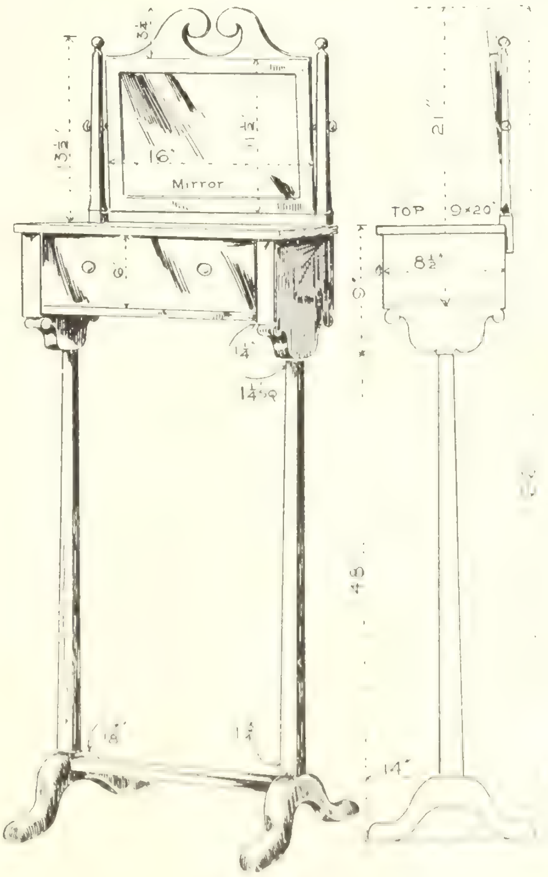


Fig. 6—Front and Side Views of the Shaving Stand

plate previously made, mark out the back curve to produce a curved slat which shall have an even thickness of ⅝ in. and have a finished width of 3 in. and length sufficient to project well over the shouldered out ends of post. After the chair is set up ready to receive the slat and banister the excess of length may then be marked and cut off to have an overhang of ⅛ in. on outside of posts. Use a depressed screw on each post and fill up after with flush plugs.

The banister may be flat, measuring 4 in. in width and [illegible] in. in thickness.

Figs. 4 and 5 will give further information about the building of this chair, and in passing it may be mentioned that the same directions apply in building a reception, or light hall chair, except that the back would be continued to a customary height of 20 in. from top of seat, and 18 in. would be the height from floor to top of seat, instead of 19 in., as shown.

The shaving stand, Fig. 6, showing front appearance and side view, will, I am sure, house all a man's toilet articles, and from its light open construction permit him to move it about to secure favorable light.

For its height over all, of 66 in., the foot and shaft are in this instance made of 1¾-in. material, the shaft being tapered on four sides from bottom to top, to 1¼ in. square, where it is firmly doweled with a large long dowel, to the ends of the case, which are also 1¼ in. square, where it is firmly doweled with a large long dowel, to the ends of the case, which are also 1¼ in. thick. This shaft properly, however, should continue through the centre of these end panels and be planed off, and scraped smooth with the main surface. This method would give unquestionable strength and pay well for the added care of producing good work.

Make use of the "construction frame" referred to in Fig. 3 for constructive strength and for the drawer to slide upon.

The mirror standards are made of 1-in. squares of well-selected stock for strength and are secured in the manner shown. They can be left straight or given a taper, as shown, with a neatly turned ball at the end. The mirror frame is plain like a picture frame, with the top ornament added, such as the open pediment shown, or some other simple Colonial feature. The foot, while it may properly be left smooth and square edged in its final finish, may be safeguarded from damage and mar in use by giving the top edges a well-rounded form. In place of the single swinging mirror a triple form of mirror similar to that provided for in Fig. 2 is often desired for shaving operations.

For guest room or a room not provided with running water, a washstand and somnoe will be found to be a most necessary form of furniture. Fig. 7 indicates sufficiently the construction and manner of mak-other furniture in a bedroom when made in basswood ¼-in. plate glass is now much used for the top of such or maple and given an enamel or old ivory finish. A ing it. This form is very frequently in harmony with furniture.

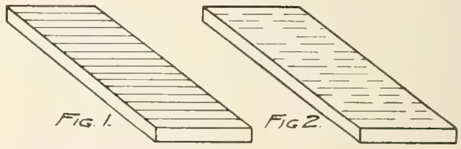
The annual meeting of the Gum Lumber Manufacturers' Association will be held January 16 next at the Hotel Gayoso, Memphis, Tenn. Arrangements have been made for an interesting programme which will include addresses on "Kiln Drying Lumber" and "Cost of Production." A further announcement will be made later. The Secretary of the Association is Mr. J. M. Pritchard, of Memphis.

Jointing Cylinder Knives

Specially contributed by H. H. Allen

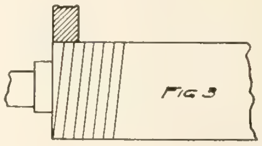
SOME men working with fast feed planing machines have difficulty operating the jointing devices with which the machines are equipped. This is largely because the average operator fails to understand thoroughly the true purpose of the devices; he does not appreciate to the extent that he should how vitally properly jointed knives make for finely finished lumber.

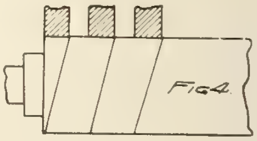
Jointing is a truing, not a sharpening operation. Notwithstanding this, however, when stock coming from the machine begins to show the effect of dull knives, many operators, instead of re-grinding the knives, will attach the jointer and increase the already too heavy heel on the knives. Evidently they imagine, because some other operator has told them that knives will stand several jointings to one grinding, that jointing is a sharpening operation. Never was a greater mistake made, and that the mistake is common becomes forcibly evident by a visit to mills using modern, fast-feed planers.



It is true in many instances that knives will permit of four or five jointings to one grinding. However, this is so only in instances where knives are jointed properly, removing the least possible amount at each jointing. Immediately a heavy heel develops, which has a tendency to blister the lumber and choke up the machine. Added jointing only increases the unfavorable condition.

The purpose of the jointer is to bring all the knives in the head to a true cutting circle. If the knives are ground in or set in the head with no regard to the importance of retaining as nearly a true cutting circle as possible, naturally the jointer will have to be brought to bear more heavily to rectify the inaccuracy of grinding or setting. The result will be that in bringing all the knives to a true circle some will be jointed heavier than others and will therefore develop a heavier heel. A heavy heel on a knife is not accompanied with the best results. It will therefore be seen that accurate grinding of knives in or setting in the head is the first and necessary step toward accurate jointing. For where knives are ground in or set in the head with greatest accuracy the least possible amount need be jointed from the edges of the knives in making them all cut uniform.





The jointer should never be brought to bear heavily on the knives. Just barely true them up. Neither should the jointer be drawn back and forth rapidly. If this practice is followed, it cannot help but result in poorly finished lumber, as the quick passing over of the jointer stone leaves high and low spots in the cutting edge of the knives. Fig. 2 shows the result on finished lumber of this kind of jointing. Fig. 1

shows the cut of the knives as it should be; each knife making a complete cut across the entire width of the stock. In Fig. 2 the cut of the knives is broken. This condition is frequently referred to as "checked" lumber, and is the result of heavy, fast jointing.

In Fig. 3 the writer has attempted to show how slow jointing results in the cutting path of the jointer stone completely overlapping. In Fig. 4, where the jointer has been drawn rapidly across, it will be seen that the stone cuts a spiraling groove clear across the knives. In other words, high and low spots are left in the knife edge and just so surely as they are there so surely will the lumber show a surface full of objectionable "checks."

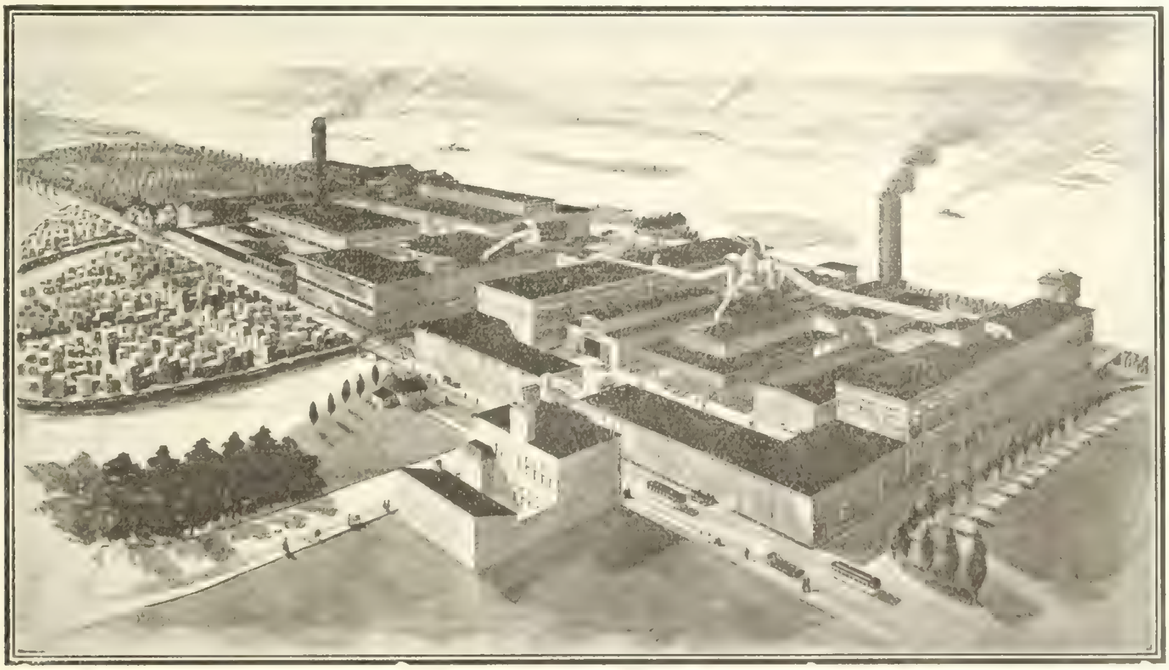
In jointing adjust the stone so that it just touches the knives. Don't run it down until the sparks fly—that's radically wrong. With the stone merely touching, slide it slowly back and forth across the knives a couple or four times. Now adjust it to take a slightly heavier cut and go across six or eight times more. Unless the knives have been ground or set with great inaccuracy this should be sufficient to put the knives in proper condition.

Always bear this in mind: the least removed from the knives the better. Joint slowly and carefully. If you follow this advice you will save time and worry and lumber will leave your machine in the finest possible condition.

The Edwards Woodworking Plant at New Edinburgh, Ont.

THE city of Ottawa, Ont., is known throughout the woodworking trade as the home of a number of large saw mills and wood-working factories, which have become of such great importance to the industrial life of the country as to become practically national institutions. One of the most striking instances of this industrial growth is the plant of W. C. Edwards & Company, Limited, at New Edinburgh, an eastern suburb of the city of Ottawa.

The first impression which one secures when visiting this plant is that of the infinite pains and care which have been given to the securing of permanence and stability in connection with all the buildings in which the numerous departments are housed. The object of this article is to touch upon a few outstanding features so as to give a descriptive impression of the whole.



Plant of W. C. Edwards & Company, Limited, New Edinburgh, Ottawa, Ont.

The wood-working plant at the New Edinburgh mills is housed in a solid reinforced concrete and brick building, being as nearly fireproof as engineering skill and money can make it. In the sash and door interior finish factory alone, employment is afforded for between seventy-five and one hundred skilled mechanics, who are receiving the highest wages obtainable for first-class workmanship. The raw material upon which they operate includes red and white pine, birch, red oak, plain and quarter-cut oak, ash, beech, maple, and basswood. These are all carried in stock, and the firm also import in large quantities such woods as mahogany, walnut, teak, red gum, cypress, yellow pine, whitewood, white oak, plain and quarter-cut oak, etc., which are used in the production of high-class interior finish.

Among the productions of this plant are included a great deal of the choicest lines of hardwood finish for interior office, house, bank, church and railroad stations work; notable examples of the output being the interior work done in the Chateau Laurier, The Grand Trunk Railway Station, the A. E. Rae Company's Building, the Ottawa Journal Building, the Roxborough apartments, etc.

One of the most interesting branches of the plant is the door department, where doors are manufactured in every variety of finish. The cores are built up with extreme care, so as to eliminate warping, shrinking, or twisting. Only men of exceptional experience are employed in this work, which also requires the best material obtainable, and the latest improved machinery. All the veneers, which are used in door production, are selected with extreme care for their color and grain.

On leaving the interior finish factory one notices immediately the sprinkler system installed throughout the yard, store houses and buildings. Wherever there is any danger of freezing, or where climatic conditions would render the wet sprinkler system unsuitable, the compressed air system is used. In fact every practical means has been adopted for fire prevention. Not only is the plant equipped with an efficient sprinkler system, but one comes across hydrants, installed at important points for fire protection. The Dominion Signal and Messenger Service is also installed by means of which a watchman is telephoned to in case he is fifteen minutes late in ringing in any station. This insures that every department shall be inspected by the watchman once an hour.

In the planing mill, which a visitor would probably inspect after passing through the interior finish factory, there are located five planers, a power trimmer, self-feed rip saw, edger, and various other types of saw and filing equipment. Beyond the planing mill is located the boiler house, an extensive building, which is kept spotlessly clean. It is equipped with twenty-four boilers. The blower system from all the sawdust and shavings producing departments feeds these boilers automatically. Cables circulate the sawdust and shavings so that they are fed to the rows of Dutch ovens connected with each boiler. The boiler house is constructed of concrete. Passing from the boiler house to the electric power house, one sees five dry kilns of the latest design, and next comes the large electric shop for maintaining and caring for the electrical appliances.

The Power Plant

In the power house a descent is made to the foot of the falls, where the turbines, generators, and steam auxiliary plants are situated. Here the water takes a forty-foot drop and operates the turbines. Two turbines are already working in connection with two electric generators of 1,500 h.p. Another turbine is to be installed. The plant also has a steam auxiliary. In the condenser house further means of fire protection is installed in the form of a Worthington pump which is capable of pumping one thousand gallons a minute.

Next, one comes to the Hardwood Flooring factory, located near an extensive shed in which all kinds of dressed lumber are stored. In this plant every variety of first-class flooring is produced.

Another large section of the plant is the box factory, where all sizes and shapes of box shooks are produced. The equipment of this plant includes printing presses for marking boxes with the purchaser's label. Over eighty men are employed in the box factory alone. Recently, a bright and commodious building has been added to the group, to be used as a cutting-up mill. The lumber enters this mill in the rough and is cut into the various sizes required for the box factory and the sash and door factory.

One of the most interesting features of the whole plant is the extensive stabling equipment, which provides accommodation on its two floors for almost one hundred horses.

A short distance from the stables are located the machine shops, the blacksmith shop and forge, and carpenters' shop. These are all situated on what is known as Green Island. On this, the Ottawa side of the Rideau River, is located the saw mill, where the logs are brought to be converted into lumber, and hauled to the various lumber yards surrounding the mill and piled ready for shipment.

Making Over Management Methods

THERE is no better injunction to offer a new manager who would change an existing system of supervision than the words, "go slowly." The average factory which goes through a complete reorganization must do it without cutting down production and generally the customs of years cannot be unduly disturbed without reaction either in the form of labor troubles or reduced production. It is well to forget for the time being about scientific plans for the payment of labor, methods of routing work and speeding up machine tools. These are certainly ultimate necessities but it is the unseen foundation that must first be laid; claning up, providing good service, good records, good arrangements—these things do not attract the eye but are the indispensable rock foundation without which any superstructure will be unstable.

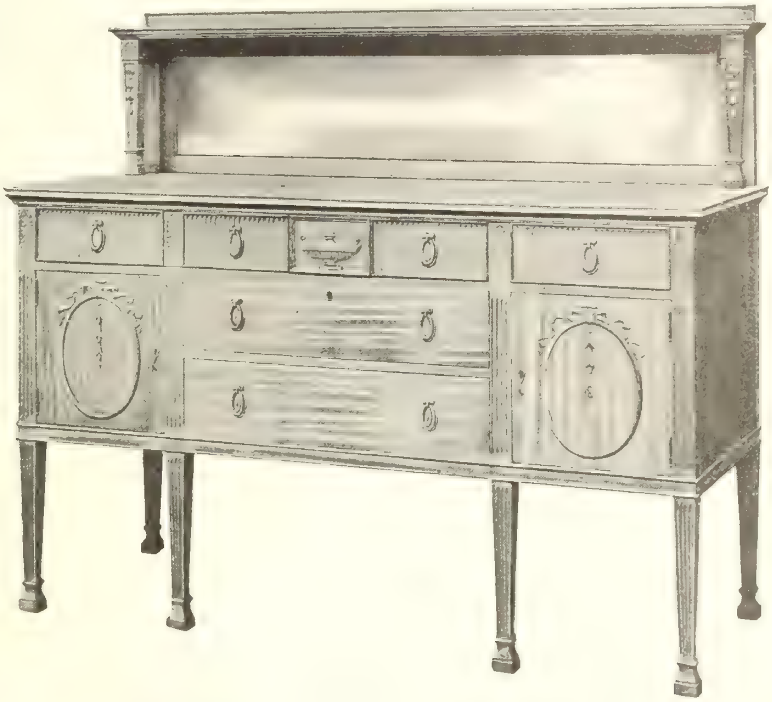
Leading manufacturers of hardwood veneered doors have each their own special forms of construction for the stiles and rails and in the accompanying illustrations we show a horizontal cross-section through the stile of one form of door, also elevations of two designs of front doors all constructed by what is designated as the "Korelock" process. The latter, it will be observed, is a dovetailed process which renders the construction strong and rigid and is perhaps the feature that more than all others has given practical builders such great confidence in it. The doors illustrated are of birch veneer, which permits of a beautiful polish and constitute a very attractive feature of the house in connection with which they may be used.

Of special interest are the inlays of red gum (now quite black), which are made out of some sections of a very old corduroy road found during some recent excavations in Melbourne. The inlays generally are of satin box and red gum, with squares of Queensland opal, mother-o'-pearl, turquoise, and pure gold. Some very rich pieces of musk and wild olive have been used as insets in the panelling. A carved band around the table has a distinct Australian significance, comprising a band of gum leaves, with wattle, and containing the local flora and foliage of the different states.

At a time when manufacturers are searching the world for pencil woods, it is interesting to learn that juniper wood from the Indian reservations of New Mexico and Arizona is expected to prove an excellent material for the manufacture of lead pencils.

A chair, stated to have been made from the timber of a wreck, by Peter the Great while a tenant of John Evelyn, the diarist, at Deptford, Eng., was sold recently at Christie's, London, for practically $100.

A Few Attractive Designs In High-Grade Furniture



Mahogany Buffet. Top 23 x 60 ins. Plain mirror 10 x 52 ins.

THE furniture designs reproduced on this page are featured by the Chas. Rogers & Sons Company, Limited, Toronto. They are an excellent example of the Adam style and consist of side table, buffet and chairs. This company are extensive manufacturers of up-to-date designs in period furniture, special attention being given this season to manufacture from the Adam and Jacobean styles. The firm do an important export trade in furniture during normal times.

The Adam style of furniture is very similar in some respects to Heppelwhite and Sheraton. The Adam brothers, who were architects, introduced a kind of composition ornament that was applied to the wood. Most of their decorations were in low relief, either composition or carved. Legs of chairs, tables, etc., were usually square, fluted and tapering. Some of the Adams designs were taken to America during Colonial days and formed the basis of what is now known as Adams Colonial. The most important characteristics of the Adam style, which is Eighteenth Century, are the carving of figures such as urns, festoons, ram's heads, also the classical moulding and delicate fluting.

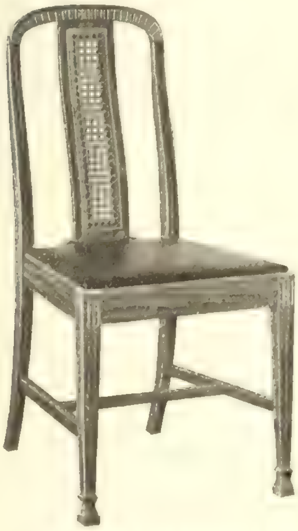
To be careful in grinding your knives and careless about the selection of abrasive wheels with which to do the grinding is just as bad as to be thoughtful in the selection of wheels and then careless in the use of them. Care all along the line is the thing that gets the good results.

It is being admitted now that in the packing of furniture and other wood work for shipment, heavier crating or more body in crating often saves damage. This is but in line with arguments that have been made from time to time, that we need to put more lumber and strength into packing boxes and cases instead of trying to see how light we can make them.

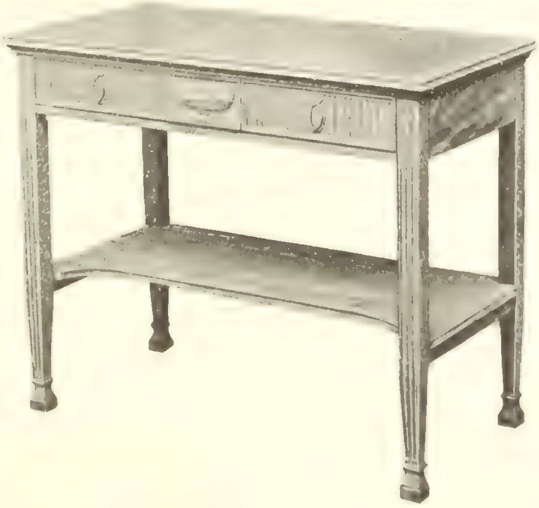
The gentle art of flattery will help a man sell veneer or panels, but he has to put the quality in the product to make satisfied customers and get repeat orders.

In operating either a drum or belt sander, to get the best results one should, wherever practicable, study the run of the grain and sand with and not against it.

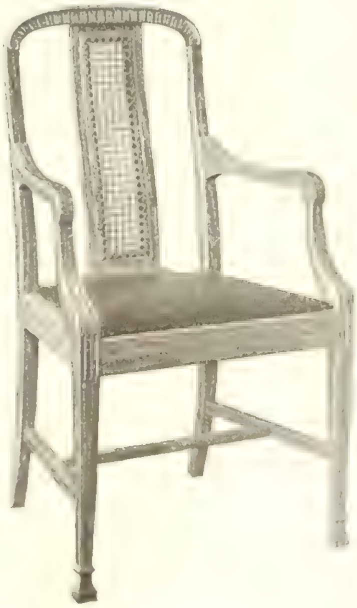
A Few Attractive Designs in High-Grade Furniture



Mahogany diner with cane panel.



Mahogany side table. Top 19 x 38 ins.



Mahogany arm chair with cane panel.

QUESTION BOX

A Practical Department of Reference for the Practical Man

Disposal of Wood-waste

Q.—"Referring to an article in your paper of last month concerning the disposal of wood waste from manufacturing operations, we are, in common with nearly all operators of woodworking plants, greatly interested in this question. There are undoubtedly many ways in which pieces of wood can be disposed of in the manufacture of other wooden articles, but we understood that there were processes perfected for the production of some chemical by-products, the value of which would be more than could be obtained in any other way. Can you give us some information on this point?"

A.—The production of alcohol, acetic acid and other products from wood waste is an attractive idea and has claimed the attention of many men well qualified to work out the technical details of the processes involved. While their efforts have met with a certain amount of success, there are no processes known today, so far as the writer has been able to ascertain, which can be called commercially successful. The thing looks promising enough, and much money has been spent in an effort to hit upon the right processes, but so far the amount of capital involved, the size and complexity of the plants, and the cost of the finished article make it impossible to compete with the same articles obtained from other sources. It is possible that there have been some recent developments in this connection and if so, further reference to this inquiry will be made in another issue.

Best Location for Dry Kiln

Q.—"In planning the location of a dry kiln, where is the best place to put it—in the yard, near the unloading point, or near the mill, where the lumber can be taken from the piles and dried as required, passing from the kiln directly into the mill?"

A.—If you are drying much lumber, there is only one place for the kiln, and that is where the stock can be unloaded direct from the cars onto the kiln trucks. Anyone who has a kiln and steam enough to operate it finds it a paying proposition to dry all stock that is to be manufactured, consequently the kiln can usually be kept full; and if there is stuff that must be piled in the yard, it is easy to go around the kiln to get it there. Between the kiln and the factory, there should be provided a covered shed where the stock as it comes from the kiln can be stored on the trucks for at least a week before it is fed to the machines. The air circulating around the lumber acts as a kind of tempering process, and the longer it goes on the better the condition of the lumber when it comes to be worked. We have all noticed fine finish in houses and in furniture that after six months or a year shrinks a little or a lot as the case may be, sometimes resulting in ugly cracks which nothing but new panels can efface. This is simply the result of the lumber adjusting itself to its conditions, and relieving the strains set up by a bad process of drying. Of course, under a coat of finish, this change takes place slowly and sometimes does not show up for two or three months or longer, but if this same lumber had been given a chance, after coming from the kiln, to adjust itself to the atmospheric conditions, the internal strains and natural shrinkage, which before manifested themselves in cracks and twists in the finished product, would have dissipated themselves harmlessly while still on the trucks and the lumber would have been softer, easier to work and permanent in dimensions. So, by all means, locate the dry kiln far enough from the mill that a tempering shed of liberal proportions can be interposed between them, containing tracks just like the kiln and connected with the mill and the unloading place, so as to minimize the handling expense which so often brings the cost of kiln dried lumber too high.

Relating to Pump Troubles

Q.—"In our mill we have a drainage well, which is meant to be kept clear by a vertical centrifugal pump, driven by a Wagner 1 h.p. 110-volt a.c. motor, direct connected. The motor is intended to be started and stopped automatically by the water in the well. It worked very well at first, but we began to have trouble with it, and the motor finally burned. This has happened several times. The makers of the pump insist that it is all right for the work and yet it has just burned out again. The pump has a three-inch suction and a two and one-half inch discharge. It starts to pump at a five-foot head and stops with a ten-foot head. Can you give us some clues as to what the trouble might be, so that we may, in case it is our fault, guard against similar occurrences in the future?"

A.—As the manufacturers of the pump say, the motor is large enough for the work all right, provided the conditions are normal, but there are many things which might well cause the motor to be over-loaded long enough to burn it, and the following should be looked into. It is possible, without great loss of efficiency, to have the motor rewound to develop one and one-quarter h.p. instead of one h.p. While this may not be essential, provided the overload was in the pump through the temporary obstruction of the discharge. the extra capacity might prevent another burnout. When the motor is installed again, have a voltmeter and an ammeter connected into the circuit and watch it through its period of activity, noting all the conditions of load, condition of motor, etc. A drop in the voltage of more than five per cent. will make it take a greatly increased current and cause the motor to heat. The longer it runs the hotter it will get, and unless protected by proper fuses, might burn the motor. The normal current of this motor will be fourteen amperes, and as this type of machine takes three times its normal current in starting, the fuses should be about 40 amperes, but no more. In fact they should be just large enough to prevent blowing in starting. The proper size can be best determined by experiment. These motors start with the brushes in contact and when the rotor attains full speed, little weights at the end of the rotor snap out by centrifugal force and throw the brushes clear from the commutator, after which the motor runs under its normal current, or about fourteen amperes. If the brushes should fail to be thrown out, the motor will continue to run under conditions which will enable it to consume three times its normal current, but as the windings are not built to stand this long, they will burn out unless protected by proper fuses. Look over all connections and joints in the wires to be sure that there are no points of high resistance. Be sure that the outlet of the pump is free and that the moving parts turn freely without rubbing, and you should experience no further trouble.

Criticising the Bonus System

Q.—"In a recent issue of the Candian Woodworker, you had an answer to an inquiry regarding piece work in woodworking concerns, in which a form of bonus system was recommended as the most satisfactory form of payment for labor. As a manufacturer in the woodworking line, I desire to state that to my mind the bonus system has a lot of disadvantages which make its application of doubtful value. For instance, it guarantees the worker a day's pay under any conditions, whether he has earned it or not, and in case of less than the required amount of work being performed, he gets his money just the same, while if he exceeds the required rate, he is paid for his increase. It seems that he wins in any event and the manufacturer has to pay. Personally I cannot see much in the system, but perhaps I have not fully understood its application.

A.—The criticism you have made is a general one, and is usually made by people who have not gone far enough into the matter to realize all the ins and outs and arrive at a proper balance of the advantages and disadvantages. It is true that the worker is guaranteed a day's pay, but not his full day's pay, as his guaranteed rate is considerably lower than the rate at which he lets himself. Thus a twenty cent man's guaranteed pay would be figured at about seventeen and one-half cents, sufficiently below what he is actually worth to make it irksome for him to avoid earning his bonus, which gives him a chance to exceed his regular rate, and secuer some return for his enterprise. Further than this, the basis on which his bonus is figured should be arrived at by taking his average day's work for some months, which is what you have been satisfied to pay him for straight day work heretofore, at the rate of twenty cents per hour. When you establish this as the minimum, for which you will pay only seventeen and one-half cents, you have made a gain at once of twelve and one-half per cent, provided he continues to work at the same gait. If he sees his opportunity and gets after the bonus you agree to give him for increasing his previous average, he will have to very materially increase his output to score, but you may depend upon it that he will let few days go by without collecting his bonus, thereby giving you a greatly increased output at a greatly reduced cost and giving him a chance to increase his pay to cover his increased effort, as is his right and due. The whole agreement makes a very satisfactory bargain in which both parties benefit according to the risks they take, and no other kind of a bargain is really satisfactory. You may fool yourself into thinking you can drive good men without giving them any return, but as a rule you get just about what you are willing to pay for, and it is a lot cheaper and pleasanter to lead the average man than to drive him.

Aluminum for glue is claimed to have the quality of non-adherence, which is an item worthy of consideration.

The Hardwood Market

THE last few weeks have witnessed quite a noticeable improvement in the general tone of market conditions. While the outlook of hardwood men during the somewhat gloomy periods of August and September was scarcely of the optimistic sort, the present attitude of representative dealers in the wholesale trade has completely changed. Briefly, it may be asserted with some degree of confidence and at the same time with satisfaction, that the interval of patient waiting for trade to improve is at last drawing to a close, and that the tone of confidence which pervades the hardwood trade is fairly certain to assume more definite proportions in the near future. From enquiries among representative hardwood men in Toronto the impression is gleaned that business in hardwoods is inclining in the direction of increasing firmness. One dealer in particular observed that his firm had put through more business during the last month than had been done in any month in the previous year or so. This business, however, was based very largely upon orders sent in for small cars of mixed lumber demanding immediate delivery. Mixed car lots have formed the greater proportion of orders received during the summer and fall, and in this respect there is little prospect of an early resumption to the more courageous policy of larger and more definite orders. The inevitable result is that stocks have been piling up. To meet this phase of the situation many mills in the United States have closed down, preferring as they did to take this step rather than accumulate large stocks for which there has been little demand for some considerable time. Prices remain firm on the whole, with the exception, perhaps, of mahoganys, the quotations for which have materially lessened owing to slow demand. American hardwoods, including gum, red and white oak, are most in request at the present time and prices remain firm. Factory buying continues meagre, consumers adhering to the policy of acquiring no more than is necessary for immediate use. The army requirements brought about by the war are responsible for a perceptible upward move in the demand for thick birch.

The financial situation has not unnaturally been brought to the forefront to a considerable extent during the last few weeks. Discussing the general situation brought about by the extreme tightness in the money market, the Hardwood Record says:—"Market advices from representative points during the past week establish two most pertinent facts. The first is that commercial bodies everywhere are putting forth their very best efforts—are utilizing their keenest intelligence and most thorough training for the purpose of outlining in an intelligent, scientific and business-like manner plans for taking full advantage of what opportunities are offered to this country in fields of export which have not as yet been exploited to any extent whatever. From everywhere come reports of meetings of commercial bodies for the definite and specific purpose of solving this problem as expeditiously as possible, but primarily in an intelligent and permanent manner, so that the trade which will be worked up will be established on a permanent basis and along lines which will to a degree mitigate the ill repute of the exporting business which our American business men have felt for so many years. With the thought of the entire commercial structure concentrated on these plans, it is simply a question of time when definite strides in the direction of increased foreign trade in new fields will be made, and judging from actual accomplishments up-to-date, this period of time will not be unduly long."

Reviewing hardwood conditions in the United States, the Southern Lumberman makes the following observations:—"Hardwoods seem to be in the lead with respect to average prices on the stock moving. The smaller operators, pinched financially, continue to sell at very low prices, just as they have been doing, but the larger and stronger concerns have continued to hold stoutly for better prices and are beginning to receive them. However, it cannot be said there is any large movement of any stocks of hardwood stock to market."

Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., November 15, 1914.—The lumber situation has reached a very interesting stage. While one opinion is as good as another, it seems fairly safe to say that business with lumber consumers ought to show steady improvement from now on, and consequently that the demand for hardwoods should be on the up-grade. October was undoubtedly a much better month in this respect than September, and November and December, in spite of the fact that they are usually light business periods on account of the approach of the end of the year, will be better, relatively speaking, than that, because consumers have been using up all their reserve stocks, and current operations must be provided for by additional purchases of lumber.

Everything considered, this seems to be the psychological moment to buy lumber. Conditions during the past three months have been about as unfavorable as possible, and prices have declined considerably on that account. From now on the reaction is to be expected, with prices moving in the other direction. In spite of the terrific assault on hardwood prices resulting from the war conditions, there is only one commodity which has really collapsed, and that is plain oak. Present quotations on plain oak, both white and red, are so low that it is safe to say the price does not represent the cost of stumpage, plus transportation, not to mention the manufacturing cost of $4 or $5 a thousand. The consumer who needs a big block of oak can get No. 1 common on a basis of $25 a thousand at the Ohio river. This is about $6 less than it was selling for ten months ago, or a loss of 20 per cent. in values. Firsts and seconds plain oak are also selling at low prices. Plain oak, in spite of the fact that most of the mills sawing this wood are either shut down or producing only a fraction of their normal output, is still in excess supply, and until this excess is disposed of, it is hard to see how any improvement in the situation can come about. The big stocks now held are exerting a bearish influence on the market, and while it must be admitted that any rapid improvement in business would find the supply small, and green lumber on sticks of too little extent to help much, the amount of plain oak in the country to-day is entirely too large, and prices, in response to the inexorable law of supply and demand, have fallen.

It should be pointed out, however, that this applies to four-quarter lumber only. Four-quarter No. 1 comman plain oak is a staple of staples; and nearly every mill which cuts oak accumulates more of this item than anything else. That is why the price has suffered to such an extent. When it comes to other thicknesses in plain oak, however, such as five and six-quarter, the buyer will find that he must pay just about as much as in normal times. That is because the closing down of the mills has made the available supply of these items very small, and while the supply is probably sufficient for the present needs of business, even a slight improvement in the situation would cause a scarcity in other thicknesses than four-quarter, which would amount to a famine. In view of the slightly improved outlook, however—coupled with the certainty that business can't get any worse—it does look as though oak of any thickness than four-quarter would be a mighty good buy. And four-quarter at $25 at the river is so low that anyone with a speculative strain and a legitimate use for the lumber would be justified in taking a few hundred thousand feet off the market. He might excuse himself, too, by pointing out that he is emulating the Buy-a-Bale-of-Cotton movement with one just as sensible and praiseworthy: Buy-a-Car-of-Hardwood!

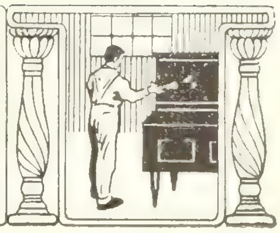
Quartered oak is in much better condition than plain. Common quartered oak is much weaker than firsts and seconds, some special grades of the latter having sold up to $80, this price being quoted f.o.b. the Ohio river. Common has sloughed off a little as to price.

Mahogany has been hit pretty hard as to price, strange to say, for in view of conditions disclosed when the war first broke out, many predicted that there would be a marked increase in the quotations on this wood. However, conditions have been entirely too unfavorable for anything of this sort to happen. In the first place, the demand has been below normal, furniture factories and other leading consumers operating at such a pace that they were not inclined to get scared over the prospect of a shortage of material. In the second place, there are plenty of logs in England, and as transportation facilities are all right, there would be nothing to prevent this country from drawing on the British market for additional supplies. There has been no indication of any considerable movement, however, so that one seems to be justified in assuming that there is plenty of mahogany on this side. It is also true that the leading mahogany houses have good stocks of lumber and veneers and logs, and with the demand slack, prices have naturally declined. It would not be stretching the truth to say that prices are $5 a thousand, or half a cent a foot, lower than they were three months ago.

There is some reason for the advance on Circassian walnut, which is a really scarce commodity. Veneer houses having stocks of this material have been able to dispose of all their holdings at a good price, and the demand has been strong enough to absorb certain grades and kinds which would not move under ordinary conditions, and without the stimulus of a shortage. The American walnut houses report a brisk demand for their wood, which seems to bear out the prediction made in these columns that consumers would naturally turn to the domestic product when the supply of Circassian became exhausted, as both are brown woods and both are walnuts, and this is a brown wood year.

The call for lumber for military purposes is sure to make itself felt in the domestic markets before long; and while this will not help the furniture and other consuming trades very much directly, it will help indirectly, because it will enable the lumber trades to put more men to work, and will put more money in circulation

THE FINISHING ROOM



Uniformity in Method and Shade as Applied to Furniture Finishes

Specially Contributed by Walter K. Schmidt

By listening to others, men learn therefrom what they have discovered in their work. They learn to believe with Emerson that "every man is my master in at least one thing, and in that I hope to learn of him." This is from the pen of Thomas Dreier, and it involves a line of thought with which I would like to see the Finishing Room acquainted.

We learn from each other. We learn from the experience that we ourselves obtain by putting into practice things brought to our notice, and being on the alert for things that will assist us in our chosen vocation. We can continue to acquire information that will be of great assistance. At this writing manufacturers are busy getting out their samples for the January sales season, and the mahoganies will be very prominently shown. In America, brown mahogany is bound to be more popular. We already have on the market the standard shade which is strictly conventional on the Western continent, and differs materially from the older styles in that it is darker and shows more red. There is the Toona mahogany, Sheraton, Chippendale, Hepplewhite or Adam, and R & J Adam styles of mahogany finishes. Now, we come to our own ideal "brown mahogany," not unlike the R & J Adam and it will pass for that. But it will be better to specify which style is wanted, and not let brown mahogany (unless it be described) constitute the description of the color that is wanted.

The foreman finisher that reads this article is bound to have a call for brown mahogany, and it is apt to come to him in the shape of a little sample board. At the best, if he matches it identically, his finished product, when sufficiently aged, may vary in tone. It is easily seen that the problem of matching is not readily overcome. The sample sent in may have been hurriedly made up. Unfortunately, this is often the case, and can be traced back to the petty jealousies that exist and are allowed to manifest themselves in that trifling indifference when getting out a sample for the other fellow. Take for instance a case like this:

A dealer buys dining-room tables from one concern, because he likes the price and style. He wishes to place an order for chairs with another factory, and therefore asks the table manufacturer for a sample of the finish. The sample is forthcoming but unfortunately is small, and frequently does not truly represent the general finish that was on the table. Now place yourself in the position of head of the finishing department in this chair factory, and you can see that the latter man is the one that has the difficulties before him. Now then, from the chair man the sample is forwarded to the sideboard man, and again there is a little difference, and yet no one is too blame. After considering a condition as above described, can you wonder that for years we have hammered away in the endeavor to establish a uniformity of shades? True, some success has been attained in this effort. In some of the large centres the foreman finishers get together for an exchange of ideas, and when one factory obtains a large contract there is an exchange of ideas with the other factory that participates in this contract, but that does not assist the man who is not in a centre and who may be in a factory isolated from the other plants. Uniformity in method of production, then, is desired. With the view of enabling those who wish to avail themselves of the information formulae that will produce the adopted shade and method of finish, are published.

Brown mahogany, which so suddenly sprung into favor, can be produced in many different ways. But the stain is universally produced from scarlet, orange and block anilines. The best results are obtained by the use of two coats, the first coat being bichromate of potash and water; the second coat is made of the three colors, the filler coat is colored with Van Dyke brown, omitting the usual rose pink. The finish is usually dull.

In matching this brown mahogany, consider the wood upon which you intend to make the shade, remembering that Spanish, Honduras, and Cuban mahoganies will be affected by the bichromate much more than the other mahoganies.

Sheraton, Chippendale and Hepplewhite will answer to the following stain, modified by the increase of brown and the strength of this formula.

The first coat is made as follows: To one and one half gallons of water, add two and one-half of bichromate of potash, nine ounces of English Oak powder, four and one-half ounces of mahogany brown, two ounces of jet black nigrosine. Boil this and use as a stock solution, reducing with water to get the depth of color desired.

A Good Blending Solution

For a blending solution, or a coat to touch up the sap parts, prepare the stain as follows:

Water	4 gal.
Bichromate of Potash	12 oz.
Jet Black Nigrosine	2 oz.
Mahogany Brown	2 oz.
Mahogany Red	1 oz.
Chromic Acid	1 lb.

When the solution is complete, use one part of the solution to an equal part of water. This stain will take hold where a good many others will fail. On parts of wood that may present a "greasy" surface, it will penetrate and make uniform the entire piece. This stock solution is a valuable addition to any finishing room where mahoganies are made. The finisher will do well to get acquainted with this stain.

Australian woods are admitted to be of singular beauty and admirably fitted for cabinet-making and such purposes. A splendid example of their suitability for artistic cabinet-work is shown in a writing table, to be presented by the Commonwealth to the Peace Palace at the Hague, now on view at the Federal Parliament House, Melbourne. The table is made entirely of magnificent examples of Australian ornamental woods, comprising blackwood and silky oak from Victoria, jarrah from western Australia, blue gum from Tasmania, cedar from New South Wales, and beech from Queensland.

A Practical Talk on the Use of Varnish

NO matter how well the wood work may be done, no matter how beautiful the veneer used may be nor how well it may be laid, the best class of goods will scarcely receive the credit due it unless nicely finished. For this reason every user of veneer on furniture, pianos and other high-class household commodities should be interested in the question of finishing.

Finishing is today, in many factories, highly specialized. Even some of the different branches are subdivided, such as first, second, third, etc., coaters in the varnish room. This conduces to the very highest quality of work in these departments, and it is necessary that the work of these departments be of a high quality, otherwise the expense for rubbing will be greatly increased, and even with this increase the finish will not be what it ought to be.

In every varnish factory there is a man known as a "mixologist," whose business it is to mix together certain varnishes in order to get one varnish that will produce a certain result. When a man buys a varnish he does not always get a varnish that was originally made in exactly the way he gets it. Perhaps the salesman makes careful inquiries regarding your requirements, the price you wish to pay, etc., and then you receive a sample to try out. Now it was the duty of this mixologist to carefully study your requirements as he received them in writing from the salesman, and then take from the various tanks of varnish before him certain quantities and blend them together to meet your requirements. This varnish is supposed to be ready for use under normal conditions without being reduced.

When you use the sample you find it is not quite what you want. Perhaps it is not heavy enough in body, it may work stiffly or set too quickly under the brush, or it may dry too slowly. Sometimes a varnish will not work out well on the edges, but gives a fatty edge. Now when these things are brought to the attention of the mixologist, he consults his record to see what varnish you got, and by making certain changes in the blending he can remedy the defect.

It is not wise to be trying to use several makes of varnish. If you are dealing with a reliable maker, stand by him. He will learn your requirements and do all in his power to meet them. Sometimes there is liable to be a misunderstanding, but this can be straightened out if the proper spirit is manifested. In our shop the varnish is watched with the greatest care. Our work is all high-class and our trade is valuable to the varnish manufacturer, not so much on account of its volume as the reputation his goods receive because of our using them. If we had reason to believe that his house was trying to "put it over us" in any way, we would drop his goods like a hot iron, because we would never trust him again.

Some years ago we received two lots in succession that were unsatisfactory. When the second lot came we were greatly annoyed, to say the least. In response to our letter we received a telephone message that the manager and his mixologist were leaving by first train and would arrive in our city and visit our factory at a certain time. These men came under the impression that there was something wrong with the conditions of our factory under which the varnish was used, as they were not aware of any change in the varnish. But when they were given a practical demonstration of the working of our finishing room and saw their varnish put to an actual test, they were convinced that the fault was somewhere in their varnish and not in us. They did some hard thinking, with the result that the trouble was fixed up and everything has been satisfactory since.

But one must be careful and not test varnish for working qualities under abnormal conditions. Varnish that works freely and easily today may work stiffly tomorrow, and ought not to be condemned because of that. Varnish does not work as nicely in a high as in a low humidity. And this fact must be taken into consideration when reducing varnish to a good working consistency. Experience and common sense are worth more than a hydrometer when it comes to reducing varnish. A hydrometer will give the specific gravity, but it will not take into account the conditions under which the varnish is to be used, which conditions may vary from day to day, especially in hot weather. Varnish must be reduced sufficiently to enable one to brush it out properly, and then, to get a sufficiently heavy coat, put a little more on; not an extra coat, but an extra brush full in each coat.

The question of the kind of reducer to use is worthy of a little consideration here. The best varnish ever made may be spoiled by the use of a wrong kind of reducer. The way varnish has been made and the kind of materials used in its manufacture must determine what is a proper kind of reducer. Pure turpentine will answer for all turpentine varnishes, but before other materials are used one should get the opinion of the varnish manufacturer.

One should be very cautious about the use of naphtha as a reducer, because there are other things to be considered besides the drying and working qualities of a varnish. One can easily make a test to find out if his reducer is suitable for his varnish. Take a small glass bottle, say a 4-oz. bottle, and fill it half full of varnish, then pour reducer into the varnish until the bottle is nearly full. If the liquid used works through the varnish freely and smoothly without creating any apparent disturbance, it may be used. But if it curdles the varnish, or appears to break it up and make it cloudy, it is unsafe to use it.

The best reducer for varnish is thin varnish. Neither turpentine nor naphtha nor a mixture of the two should be used as a reducer if the varnish is to be used immediately. Having ascertained whether turpentine, naphtha or a mixture of the two is the proper thing to use, put one-third of the varnish and two-thirds of the mixture in a can and shake them together. Let this stand twenty-four hours before using. This is the only proper kind of reducer to use for varnish.

The amount of brushing varnish receives has considerable to do with the time required for it to set and dry. By brushing it out as much as possible every particle is brought round in direct contact with the air, and this is a powerful factor in drying as well as insuring a uniform coat.

The temperature of the varnish room for the first twenty-four hours after the varnish is applied has considerable to do with the durability of the finish. If the goods are being heavily bodied and the temperature is allowed to drop much below the temperature at which it was applied, there is great danger of cracking after the varnish is dry; and the lower the temperature the greater the danger.

Cracked varnish is not always an indication of a poor grade of varnish. It may mean any one of several things. If varnish is not brushed enough to spread it out properly, it will crack where it was heaviest. A sudden lowering of temperature, or even a gradual lowering below certain limits, while the varnish is soft, will cause cracking. Many pianos are cracked by being shipped in extremely cold weather. Some piano firms arrange to have cars heated when shipping in cold weather. It seems useless to spend so much time making a beautiful finish and then have it destroyed during the few hours required to move it from one place to another. But the world is moving forward, things are gradually adjusting themselves, and our railroads will soon have specially heated cars for handling high-grade furniture and pianos in cold weather.—J. C. Carmen in Veneers.

How to Finish Quarter-Cut Golden Oak

REPLYING to a query seeking information on how to finish quarter-cut golden oak so as to leave the flakes white, a correspondent of the Wood-Worker puts forward the following solution.

At the outset, let us not forget that the way quartered oak is cleaned up when finished golden has a lot to do with the clearness of the finish, also, that the oak itself has much to do with the color of the flake. Remember that oak never gets lighter in color during the process of finishing. If it is "blue" oak, or is not a nice, light sample of either white or red oak, you cannot get that nice white flake that is such a distinguishing feature of some furniture.

As a rule, in the cleaning up of wood for the finish, anything that savors of a polish is not of advantage to the finish, but the preparation of quarter-cut oak to be finished golden is an exception to that rule. Where a clear flake is desired the surface of the wood cannot be made too fine and smooth. The grade of paper should be gradually reduced until the very finest is used for the final sanding. This will insure the removal of sandpaper scratches. If these are not removed the stain will get into the minute fibres along the scratch and show dark, and if there are many of them the result will be a "dingy" appearance.

A good, clear finish is not made with a combination stain and filler. The clearest finishes are always made by staining first, then filling. There are a number of stains on the market that will produce the desired result, but if one wishes to make one's own stain he can use the following formula as a basis from which to work, changing the proportions to make whatever shade is desired. There is a standard shade of golden oak, known as the "Grand Rapids shade," and all the large wood-finishing supply houses handle a stain to produce this shade. But frequently the finisher finds himself in difficulty because this stain produces different results on dfferent woods. If one makes one's own stain he can change it to suit the wood, provided, of course, he is not given too many different kinds to finish.

The principal ingredients entering into the composition of a golden oak stain are, oil yellow, oil black, and asphaltum. A good turpentine asphaltum should be used. The oil black should be jet black, and the oil yellow should be the pale lemon shade. This is very important.

Dissolve 1 oz. of the oil yellow in 1 pt. of turpentine, and dissolve 4 ozs. of oil black in 2 qts. of turpentine. If one has a hot water vat, dissolution may be hastened and made more complete by the use of heat. For obvious reasons it would not be safe to use these materials near a fire.

After the oil yellow and oil black have been thoroughly dissolved, pour them into 1 gal. of the asphaltum. This will produce a beautiful, rich shade of golden oak stain of about the consistency usually supplied by stain manufacturers. This may be reduced to the desired depth of color by the use of a reducer made of equal parts turpentine and benzine.

This stain may be applied either with a rag or a brush, but it should be applied evenly and not very heavily. On flat surfaces a better and more even job can be made with a rag than wth a brush. If the stain is not put on with something that will let it off evenly, it is liable to be taken up too rapidly by the soft, absorbing parts, will not dry properly, and will ooze out after the goods are filled and varnished.

A properly-applied coat of stain will dry sufficiently in from thirty minutes to an hour, to allow of filling. The filler is an important item in the making of a nice, clear, clean golden oak. If one wishes a real, light-colored flake, the oil in the filler must not contain any coloring matter. Where a colored filler is used the coloring matter must be in the pigment. Some finishers use a white filler, depending on the stain that is raised to give sufficient color; but one ought not to put the stain on heavy enough for that. The better way is to color the pigment when the filler is made. The best filler is made of silex. The more finely it is ground the better. Silica also make a good pigment for oak filler.

Filler should be made 24 hours before using, but it is not well to have it made too far ahead. Filler works hard and stiff when it becomes old, especially filler containing japan. For this reason one should not make more than enough to last about ten days. The proportions given in the following formula may be used for any quantity desired: 4 qts. pure boiled linseed oil; 4 qts. pale brown japan; 2 lbs. vandyke brown ground in oil. Stir the above together and add sufficient silex to make a stiff dough. Keep the filler in the dough state until required for use. Such quantities as are required for immediate use may be reduced with benzine to the proper consistency. Paste filler may be reduced to the fluid state much more easily and quickly if but a small quantity of benzine is added at the start. With this break up the thick paste, and when this is done the balance of the benzine may be added.

Oak filler should be well brushed into the pores of the wood. Unless it is worked well into the deep pores it will pull out during the process of cleaning off. Al-

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed
in two days.

WRITE FOR SAMPLE

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

THE GLUE BOOK

WHAT IT CONTAINS
Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glu*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
MacLean Building, Toronto

low the filler to stand until it has dried flat all over, then remove with excelsior or sea-moss or other suitable material. Rub crosswise the grain to remove filler; there is less danger of pulling it out that way. Work stained and filled in the manner here described will have a rich brown background to a nice white flake.

The next thing is, how to preserve this clearness during the balance of the finishing process.

The Finishing Room of To-day

By L. C. Thomas

NO greater change has come to any department of woodworking lately than that which has come to the finishing room. Heretofore this room has not been a place for machines, neither has it been given special attention as to room requirements, other than to have it enclosed and shut off from the dirt and dust of the other part of the factory. Whatever science and skill has entered, has been directed toward the selection and application of finishing materials. Now, however, the really up-to-date finishing room is laid out and operated on a scientific basis and includes machines and mechanical devices to do lots of the work formerly done by hand.

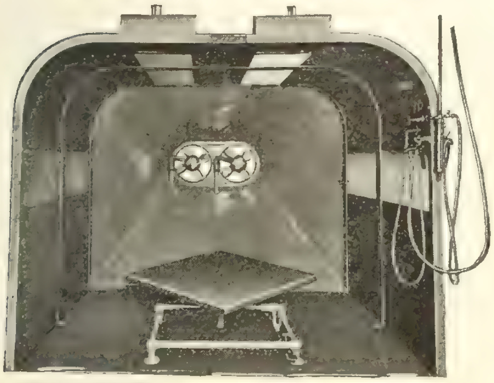
The first, and in some respects the most important and striking change that has come to finishing room methods, has to do with heating and ventilation. It has taken time to come to it, but now there seems to be a full realization of the fact that proper finish involves control of both temperature and ventilation. It has been found that varnish which may dry in a given time under certain conditions will not dry in the same time under other conditions, consequently there can be no rule for the time allowance between coats, and before rubbing varnish, unless there is some means for keeping temperature uniform and regulating ventilation.

The modern finishing room is essentially a dry kiln or drying room. It is provided with means to control the temperature and with exhaust fans to carry away the air, laden with moisture of finishing materials, and replacing it with other air that will dry the varnish uniformly within a given time. It seems that the best finishing room temperature is something near to what we used to figure for the best glue room temperature; that is, a temperature as high as one can work in comfortably. This temperature must be maintained uniform, no matter just what it is, and the same is true of air circulation or ventilation.

In addition to these requirements of the finishing room itself, there are entering new devices for spreading finish, and mechanical appliances for rubbing and polishing. The most striking thing in the way of new devices for finish spreading is in the form of a spray, which, it is said, will spread varnish, enamel or any other finish more uniformly than can be done with brushes. When it comes to rubbing or polishing there is choice of several mechanical devices to lessen the burden of labor and assist in doing this work. So, the finishing room to-day includes both scientific and mechanical ideas, aside from those formerly considered in the selection and use of the finishing material itself, and the well-equipped, modern room is in sharp contrast wth the finishing room of a few years ago. There have been changes coming to it, changes just as far-reaching and as important as those which have come into the machine wood-working department itself.—Wood-Worker.

Aeron Guaranteed **System** Paints With Air

New Steel FUMEXER (booth)



Front view of FUMEXER with Turn-table—two fan installation

With Autocool Electric Exhaust Fan Installed.

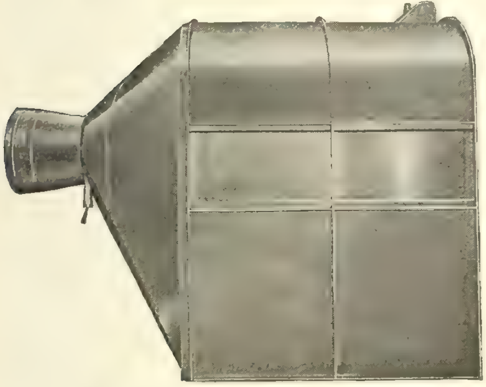
An AERON SYSTEM combination which offers the height of exhaust efficiency to your finishing room.

Here is an indestructible, fire-proof steel booth specially designed and built for service—constructed of heavy sheet steel on an angle iron frame, with wire glass windows in sides and top. (Provision is also made for electric lights when necessary—reflector and sockets are built in.)

The FUMEXER is easily installed. It will last indefinitely. It is the last word in fire-proof construction.

The back of the FUMEXER is funnel-shaped clear to the floor, giving maximum exhausting results, especially on large work. It can be placed near outside wall and short exhaust pipe run directly out-of-doors.

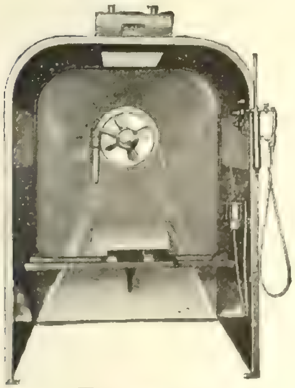
Furnished with the FUMEXER is the improved, adjustable, tilting and revolving Turn-table, which greatly facilitates the handling of all work. This Turn-table is not fastened to the FUMEXER or floor—it can easily be removed when necessary.



Side view of FUMEXER showing style of construction and funnel-shaped back clear to the floor

Installed In The FUMEXER Is The

Autocool Electric Exhaust Fan



Single fan installation FUMEXER with Turn-table

an exclusive AERON SYSTEM product, made for any current and voltage. It is an adaptation of the Ilg principle of fan motor cooling and ventilation—this means a protected and automatically cooled motor and one fully 25% more efficient than the ordinary enclosed type.

The construction of this Fan permits of the swinging inward of motor and blades at a 90° angle with frame—this means easy cleaning of blades and accessibility of all parts.

The Fan is used in small and large FUMEXERS—one in FUMEXERS up to and including 5 ft. wide, two in 6, 7 and 8 ft. FUMEXERS, and three or more for larger installations. Each Fan including motor, is a self-contained unit, and can easily be adapted to any kind of work. **The First Cost—Installed—Is Considerably Less Than That Of Any Other Style.**

The Autocool Electric Exhaust Fan requires no belts nor mill-wright work; takes up no valuable floor space; comes already installed—merely screw plug into light socket; **Will Do The Same Work As Other Style Fans With 1-10th Power Consumption.**

Correctness and completeness of every part and detail accounts for the success of the AERON SYSTEM. It can do for you in your finishing room identically the same great things that it is accomplishing for hundreds of big wood and metal product manufacturers throughout the country—simply sign and mail the coupon that follows—

THIS COUPON INSURES ATTENTION BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr St., Toledo, Ohio

I am interested in getting a better finish on my product at a 25 to 90% saving in time and labor—please send me catalog of the AERON SYSTEM and Accessory Equipment and complete information.

NAME ADDRESS PRODUCT

Veneers AND Panels

Why Veneer Joints Open

By Max Millar

ONE of the most condemning defects in veneered work at the present time is bad joints. Many an otherwise perfect piece of furniture has its beauty completely spoiled by such defects. This was brought very forcibly to the writer's mind a few days ago when calling on a furniture dealer.

After a short conversation, my attention was called to a Circassian walnut bedroom suite of beautiful design, on which the veneer matching was all that could be desired, the artistic effect being almost perfect. The case tops and head and foot panels on the beds were quarter-matched, and from a distance of 20 feet appeared to be perfect, but on closer examination the joints showed ugly gaps, and in some places the edges of the veneer had lapped. I examined the goods throughout and could readily see that no expense had been spared in their construction, the workmanship and finish were excellent, and the only visible defects to be found were the bad joints in the veneer, and in my opinion these alone depreciated the value of the suite fully twenty per cent.

What excuse the veneer man could offer for these bad joints I can only imagine, but the only reason I can attribute is carelessness. There are some veneer men who have the impression that it is a very difficult task to make good joints in Circassian walnut or crotch mahogany. This is purely imagination, for good joints are made every day on these woods, and the veneer man who thinks it an impossibility should look around and examine some of these goods, and the chances are he will not need to travel far to find plenty of evidence to bear out my contentions.

There is, of course, a vast difference in handling crotch or Circassian, compared with ordinary veneer, and if the veneer man would stop to consider the difference in the formation of the two veneers he would discover the key to the solution of his difficulty in getting good joints on these two fancy veneers.

Ordinary stripe mahogany, quartered oak and black walnut are for the most part of even texture and their response to moisture in the way of expansion and contraction is practically uniform throughout the entire sheet, and for this reason the veneer man is successful with his joints on these veneers. Now, in the matter of crotch and Circassian, practically the opposite is the case, as the texture is very uneven; in some spots it will be noticed the grain is that of end wood, while directly adjoining that is straight grain. Herein lies the beauty of crotch and Circassian, as also the veneer man's difficulties. He has failed to consider the effect of moisture on the different formations and has proceeded in the same manner as with ordinary veneer, and uneven expansion has wrought havoc with his joints.

It is not beyond the ability of the average mechanic to make good joints in crotch if the veneer has been pressed out flat and kept in that shape till it has dried, but it is beyond the ability of the best mechanic to maintain these good joints when laid in the same manner as ordinary veneer. In probably nine factories out of ten ordinary veneering is accomplished by building up the stock as it comes through the spreader, and when sufficient has been accumulated in this manner to fill a press, the entire lot is transferred to the press and the pressure applied. In this way the thin veneer is placed on the hot glue and immediately begins to absorb the moisture. In the case of ordinary veneer this does not affect the joint, as the texture of the wood is even and expansion is uniform, and the joint remains intact. There is a difficulty to be encountered here if the expansion is excessive, and that is hair checks, but I will not deal with them at this writing.

If crotch or Circassian is laid in this manner and absorbs the moisture from the hot glue, the texture of the wood being uneven, the expansion necessarily would be uneven also, and the joint is really spoiled before the pressure is applied.

Probably as good a process as any to lay crotch and Circassian is to prepare the core first; if it is to be, say, five-ply, the cross-banding should be glued on and allowed to season, and when this is accomplished they should be toothed or otherwise made ready to receive the face veneer. After this is done the glue should be spread on the core only and allowed to stand till the surplus moisture has entered the core; there is no danger from allowing the glue to become fairly well congealed. When it has reached the proper stage, it should very hastily be put to press by applying the face veneer and hot cauls.

The cauls should be fairly heavy in order to retain sufficient heat to remelt the glue. In this way the face veneer doesn't have a chance to absorb the moisture to sufficient extent to do any damage before the pressure is on, and when the pressure is once applied there is no further danger. It is, of course, a mistake to attempt too many pieces at a time. I usually consider six pieces the limit, and with pieces the size of case tops and bed panels from three to four will be found to be as many as can be handled safely.

It is folly to try and rush crotch veneering by increasing the size of the batch at the press; but this no doubt is the cause of lots of bad joints, and in such cases the only remedy is to reduce the batch within the safe limit and not try to defeat the laws of nature.—Veneers.

Difficult jobs in panel work and in veneer using are things that test skill and ingenuity and help make fame for the man who performs them successfully. They are not the jobs that the average panel man is looking for, however; he is in the business for commercial profit, and is inclined to fight shy of difficult undertakings because of their uncertainty as to cost. To make a success of this kind of work requires a man, we might say an institution, which dotes on difficulties and enjoys wrestling with intricate problems. An institution that enjoys doing these things and has the faculty for finding the solution and the facilities for doing work, can make its own price and get quite a lot of work to do that there is very little competitive bidding for.

The Evolution of the Three-Ply Box

It is something like twenty years now, since the three-ply veneer box made its entry into the wooden package world, but it is only during the past few years that it has made much active progress. It has been growing, however, during the past few years and is today not only an accepted item of the box trade, but is coming to be quite an important factor.

There is quite an interesting story in the history and development of the three-ply box idea. Like many a new idea which has enough good points in it to produce success eventually, it proved disappointing at first, and for a while was given up and pretty generally accepted as a failure. Good ideas, like good men, however, simply won't stay down. So it came back again and the present indications are that it has come to stay and to play an important part in box business in the future.

Several causes contributed to the failure of the earlier efforts. One cause that is urged sometimes is, that it came before its time and that the making of three-ply lumber proved too expensive in competition with solid lumber and that what was needed to make a success of it was a time in the lumber industry when the price of solid lumber would reach the point where it would be just as cheap to make three-ply.

There is something in this point of view, yet not so much as one might suppose, because today, three-ply box shook is making good progress in the face of the fact that solid lumber is comparatively low in price, in fact nearly as cheap as it was in the early days. It is of somewhat lower quality but it goes to show that the price is not the only thing, at least the price of lumber is not the only factor.

Construction Has Changed

One of the noticeable differences between earlier efforts to promote the three-ply veneer box and the later and more successful work along this line that perhaps has not received quite as much attention as it should, is a difference in construction. In the early days the proposition was that of making three ply lumber of practically equal thickness, and to be used in the same manner as solid lumber, whereas in the new idea in three-ply boxes it is a different story entirely. The three-ply stock used is very thin and the box strength is obtained by cleating. In other words, a cleat or frame work of strips is made for strength and the panels are made of thin three-ply stock, often only half as thick as was used in the earlier days. Not only is the stock very thin but it is made in even larger panels than were attempted in the earlier days.

There is really not much more difference between the comparative cost of three-ply built-up stock today and lumber, than there was twenty years ago. True, lumber costs a little more than it did twenty years ago, even though it has been unusually low during the pastyears. It does not cost any more though than the increased value in stumpage and we should remember that this increased value of stumpage also adds to the cost of veneer for built up work. Indeed it is probable that, so far as raw material is concerned, the veneer costs, more today compared with lumber than it did twenty years ago. At that time gum timber had practically no value and cotton wood brought very little so far as stumpage was concerned. The main cost was cutting the timber and transporting it to the mills. Now, however, all timber has value in the stump and this makes the raw material for the veneer cost considerably more than it did twenty years ago. The only points of economy in the matter of cost that have been developed in twenty years are those of cutting facilities and of equipment for handling, gluing and pressing the veneer work. There we have made wonderful progress. Glue spreading machines have been improved and new glues have been developed. The hydraulic press has become common in this work, taping machines have been invented to facilitate slicing and all around us there have been mechanical inventions to help out the work. These have unquestionably contributed quite a share to the progress and success of the three-ply stock in the box industry today as well as to its prominence in furniture and cabinet and millwork.

What seems to be the most importan point to be gleaned from a study of progress in three-ply box work, however, is that of its lightness, permitting the use of very thin three-ply stock reinforced with cleats instead of the heavier three-ply stock which, it was thought, would be the right thing in the earlier days. There are some uses of heavy three-ply for box ends and there are some heavy three-ply boxes made throughout for cartridge boxes and boxes of very severe requirements. The great progress of the three-ply box, however, has been in light weight packages with very thin panels of three-ply reinforced with cleats and at times wirebound.

It is not only to be seen in the big dry goods boxes of the east, furnishing two important elements, those of strength and of lightness, but today it is an important factor in the whisky box trade. The whisky box, in its territory, is one of the most important and expesive boxes made. The trade demands good quality, also strength and service. This has called for good lumber in the past, and good workmanship. Lately a thin panel three-ply box with cleated frame has invaded this field and has made quite a commendable record, receiving special inforsement from railway traffic managers, for it seems to hold, to stand up to the service and at the same time to be about as light as it is practical to make a substantial package.

For the maximum of strength with a minimum of weight the three-ply veneer box seems to have the best of everything that has so far been offered, and this fact is contributing more to its present progress than any other. For this reason it has been able to come back into the game after its earlier failure, and prove itself worthy and make such progress as to put it in the ranks of important factors in the packing box trade.—Packages.

The Use of Veneers and Hardwoods in Fixtures[*]

Various woods find place in fixtures as frames, shelves, drawers, braces, partitions, cubbyholes and slides. Some of these may be very cheap, because they need not possess beauty or much strength. They are as useful, however, for the purpose intended as any of the other woods entering into the construction of fixtures. Not infrequently veneers are employed that are never seen after the articles are finished. Cores and backing are often of three or five ply veneers instead of solid pieces. This is not unusual where panels or other pieces are very wide. The thin sheets of veneer are glued together until the requisite thickness is obtained, and on the outer surface of this the finishing sheet is placed. Backing of that kind is more reliable than when of one solid piece, because the different sheets are laid with grain at right angles, and any tendency of one sheet to warp is counteracted by the sheet next to it. A built-up core of that kind is stronger than one of equal thickness of solid wood, and in large pieces, such as bar and countertops, considerable weight may be saved without sacrificing strength. Built-up cores are generally of rotary-cut veneers—that is, the sheets are peeled round and round the log, and not sliced or sawed thin as most of the expensive cabinet-wood veneers are.

The manufacture of fixtures calls for a good deal of carved and inlaid work; the carved requiring solid pieces, the inlay thin cuttings of very fine wood. The carving is generally seen on posts, pilasters, capitals, pedestals, beams, columns, and ornaments; the inlay in border, mirror frames, mullions, friezes, soffets, and spandrels.

Those who manufacture fixtures buy their lumber through the usual channels, though, of course, special material must be sought outside the ordinary avenues of trade. Those who look for finely figured woods cannot afford to wait for such material to be offered, but must seek it where it is likely to be found. It is not unusual for large manufacturers of fixtures to keep buyers in the field, whose business it is to watch for bargains in choice material, and to anticipate wants as far in the future as possible. Figured stock of extra widths is nearly always in demand in the fixture factory, because there are so many places where it can be used to advantage.

As already stated, fixtures are generally divided into several classes, depending on the use intended, such as stores, banks, offices, saloons, and barber shops. Each class consists of several articles of numerous sizes and shapes. This may be illustrated by a list of articles and pieces which make up the saloon fixture class. It is often difficult to draw the line between fixtures and furniture, for one gradually merges into the other.

The two most prominent articles in the fixture equipment of a saloon are the counter and the back bar. The back bar is behind the counter, and is usually the most highly finished piece of woodwork in the place. It is nearly always equipped with mirrors set in frames which dislpay more or less artistic workmanship. Styles are as various as the tastes of the proprietor who buys what he thinks will suit his purpose and purse best. The real designing, however, devolves on the manufacturer. New designs originate with him oftener than with the man who will purchase the article. The maker studies his field and produces the best articles that will sell, and the purchaser selects the best that he can afford to buy. Back bars are often works of real art, equalling the finest cabinets found anywhere, and displaying the best inlay and carved work. The manufacturer who studies the conditions of his trade, frequently impresses upon his prospective purchasers the advantage of attractive equipment, because it excites less unfavorable criticism of the saloon than when unattractive fittings are used.

Back bars are made in any length desired by the purchaser, but the usual range is from twelve to thirty feet. The counter is the front part, or the bar proper, and though entirely separate in construction from the back bar, the two are matched in length, material, and workmanship, and constitute a single piece of equipment. The case of a piano presents no higher order of workmanship and displays no finer woods than some of the bar equipments.

Other saloon fixtures are office or wine room equipments, usually consisting of wood panels, frames, and glass, and not reaching to the ceiling; front cross partitions, made in the same styles as the foregoing; window screens, made of glass and panel work; display back bars where bottles are shown in racks and on shelves. Some of the display bars are equipped with iceboxes and serve as refrigerators. Other articles of equipment are coil boxes which are small refrigerators; workboards or tanks for bar counters, which sometimes combine appliances for washing glasses and arrangements for packing bottled goods in ice; coolers of large size fitted with various appliances to answer special purposes; sideboards containing cooling box arrangements; buffets constructed with cooling boxes; lunch counters; display tobacco and cigar show cases; tobacco wall cases; bottle cases; bar screens; summer doors; office railings; and numerous styles and kinds of settees, benches, and wall seats.

About this point the line between fixtures and furniture in saloon equipment may be drawn, so far as woodwork is concerned. Chairs, stands, and tables are furniture unless made specially to fit certain places, in which case they may be classed as fixtures.

The artistic effect is improved if all the fixtures in a room harmonize in style and color. Contrasts are not generally desired. Mahogany matches mahogany, oak goes with oak. Patchwork may be in good taste for crazy quilts, but not in fine wood combinations.

The problem of seasoning wood must be closely studied in the fixture factory because many of the articles manufactured are large, consisting of broad pieces and heavy posts, and any shrinking, swelling, warping and checking after the work is done would be very injurious. The different kinds of wood employed cannot be given the same treatment, and the manufacturer is obliged to use constant care, and to study the seasoning question systematically.

---

[*] Abstracted from the Hardwood Record.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

HAUGHTON VENEER CO.

1055 to 1111 West 22nd Street,
CHICAGO, ILL.

¶ When you buy veneers of us the quality is taken for granted—we realize that the best way to keep your trade is to more than satisfy you.

¶ With us each repeat order is just as important as the first, but, we would like to have the first—MAY WE?

Circassian Walnut
Mahogany Veneers
Domestic Woods
Mahogany Lumber

HB Hoffman Bros. Co. HB
Estab. 1867, Incor. 1904—"Nuff said"
Reg U S Pat Off

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods
ANY THICKNESS,
1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—SPECIALTY—

HB Indiana Quartered Oak HB
Reg U S Pat Off

Circassian Walnut Lumber

1/2 in. Veneer Slabs and Log Run - - 1200 ft.
5/8 in. " " " - - 2135 ft.
3/4 in. " " " - - 1685 ft.
1 in. " " " - - 2070 ft.
1 1/4 in. " " " - - 840 ft.
1 1/2 in. " " " - - 175 ft.
2 in. " " " - - 430 ft.

PRICE:
15c. per ft.
f.o.b.
Chicago

HUDDLESTON-MARSH LUMBER CO., 2256 Lumber Street
CHICAGO, ILL.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in a position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - Ohio

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for

Poplar and Red Gum Veneers and Crossbanding

Write for a quotation on this space—
it will put you in touch with
veneer manufacturers

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES— - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT

LUMBER AND VENEERS

American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills: Brasfield, Arkansas

Address all enquiries to

SALES OFFICES - - KANSAS CITY, MISSOURI

We offer for immediate shipment DRY

RED GUM

Quartered

3 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
3 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

RED GUM

Plain

4 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
1 " 10/4 "
2 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

THE FAMOUS CACHE RIVER GUM

Band Sawn —Flat—Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

VENEERS

Wisconsin Birch and Basswood

A SPECIALTY

All Thicknesses—Log Run or Dimension Stock

PANELS

Quartered Oak — Quartered Gum
Mahogany — Walnut

All Thicknesses — All Sizes

Tell Us Your Wants.

Wisconsin Seating Co.

Manufacturers

NEW LONDON, WISCONSIN, U.S.A.

Trade Happenings and Opportunities

Woodworking News from Coast to Coast

A sawmill building, the property of Mr. Arthur Moore, has been burned down at Falconbury, Ont.

The Beverley Wood Specialty Company of Toronto has started a carving factory at Uxbridge, Ont.

The Central Casket Company, Limited, Bridgeburg, Ont., has been incorporated with a capital of $40,000.

The Forest Products Company of Vancouver are planning to erect a four-machine shingle mill at Port Moody, B.C.

The Great Western Furniture Company, with headquarters at Regina, Sask., has been formed. The capital stock is $50,000.

The Canada Stove and Furniture Company, Limited, has removed its sphere of operations from Montreal to St. Laurent, Que.

At Preston, Ont., Mr. James Gillies contemplates purchasing machinery for the manufacture of sash, window frames and screens.

Sunset Sash & Door Company, whose factory building on Broadway was burned down recently, have decided to rebuild next spring.

The Woodworkers, Limited, of Victoria, B.C., have commenced the manufacture of toys in addition to their usual woodworking business.

Mr. Geo. A. Barker who for many years was connected with Bell's Organ & Piano Factory, Guelph, Ont., died recently at Granum, Alta.

At Rainy River, Ont., the Western Canada Flour Mills Company have started the erection of a box factory in connection with their stave mill.

At Guelph, Ont., Mr. W. A. Mahoney, Telephone Building, will receive tenders for seating for church chair loft, Dublin Street Methodist Church.

Windsor Lumber Company, Windsor, Ont., intend installing up-to-date machinery, individual motor drive, in their new factory now in course of construction.

At St. Marys, Ont., a quantity of additional seating is to be purchased by the Board of Education for equipment of public schools. Mr. W. H. May is chairman.

The sash and door factory owned by M. T. Schurman & Company, Summerside, P.E.I., has been destroyed by fire. The loss, estimated at $6,000, is partially covered by insurance.

At Quebec, Que., a new piano warehouse now building for Mr. C. W. Lindsay, St. John street, is well on the way to completion. It will be five storeys, 65 x 43, granite and stone construction.

The Stratford Chair Company, Limited, will soon have completed a large extension to their factory building which will increase the floor space two-thirds. Building operations will be completed in the course of a few weeks. The new building will probably be used for the holding of a furniture exhibition in January.

The St. Marys Wood Specialty Company, Limited, St. Marys, Ont., are reported to be in the market for slab re-saw of the Fisher type, also an Ober axe handle lathe and an Ober rod machine.

Newayago Company, Limited, has been incorporated to carry on the general business of lumber merchants, to erect sawmills, etc. The company's capital is $200,000 and the head office is at Port Arthur, Ont.

"Foisy Freres Incorporatee" has been incorporated with capital stock of $5,000 as manufacturers of and dealers in pianos, organs and musical instruments. The head office of the company will be at Montreal.

The woodworking factory of D. Porter & Sons, Stellarton, N.S., is reported to be working at full capacity. The yards are stocked with large quantities of lumber for the purpose of meeting immediate demands.

Mr. George J. Brown, for over twenty years superintendent of Layton Bros., piano manufacturers, Montreal, died on October 25 at Westmount, Que., aged 65. Mr. Brown was for several years superintendent of Evans' piano factory, Ingersoll, Ont.

The Beaver Wood Fibre Company, Limited, Thorold, Ont., which was incorporated recently with authorized capital of $1,000,000, will acquire the property and plant of the Beaver Company in Thorold with an output of about 60 tons a day of beaver board.

At Chatham, Ont., the header mill belonging to the Sutherland-Innes Company has been completely destroyed by fire. A stave mill located about 40 ft. apart was saved, but a large stock of barrel heads in the kiln at one end of the header mill was practically destroyed.

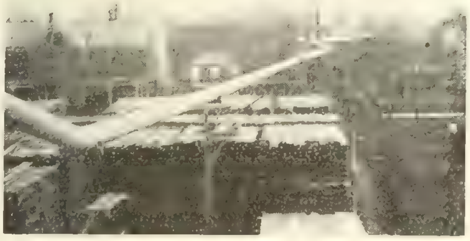
Business in the furniture trade would appear to be improving steadily. Several Ontario firms have experienced little depression in trade within the last few months, while the volume of business in some factories is exceptionally good for this season of the year.

Mr. J. E. Jacques, of the Berlin Furniture Company, Berlin, Ont., in company with his wife and daughter, was crossing the Belgian-German border when war broke out in Europe. Fortunately Mr. Jacques managed to reach Switzerland without the loss of any of his baggage.

The sash and door factory of Mr. R. Neville, Jr., Outremont, Que., has been destroyed by fire, the loss being estimated at $100,000. The mill was erected four years ago, and was very well equipped. A large quantity of lumber was also burned. The insurance covered about half the loss.

Messrs. Baxter D. Whitney & Son, Winchendon, Mass., manufacturers of the well-known line of woodworking ma-

If you really take a live interest in Trade Happenings and Opportunities you will not overlook the Canadian Woodworker's December Essay Contest which closes on *November 30*. It is essentially an opportunity for the progressive, practical man, the department foreman and the superintendent.



Slow Speed Low Power Shaving and Dust Collecting Systems

New Systems designed. Old systems corrected.
Long distance blows a specialty.

Trained Mechanics. We know how.

Consult our Expert

INVINCIBLE BLOW PIPE CO.
CHICAGO 176 George St., TORONTO

PATENTS
STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) TORONTO, CAN.

The business of Manufacturers and Inventors who wish their Patents systematically taken care of is particularly solicited. Ask for new free booklet of complete information.

PATENTS
Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% **PROFIT SHARING**

Sums of $100, $500, $1000 and up. Safe as any mortgage. Business at back of this Security established 28 years.

Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

OVER 65 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

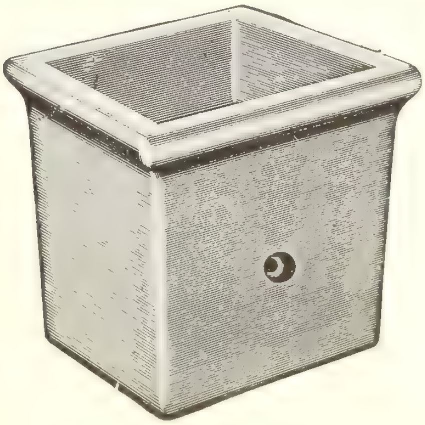
Patents taken through Munn & Co. receive *special notice*, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.

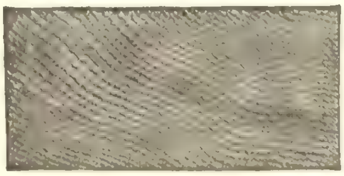
MUNN & Co. 363 Broadway. **New York**
Branch Office, 625 F St., Washington, D. C.

Metal Shoes For Table Legs



We manufacture an unusually fine line of cast brass, bronze and iron with various finishes. Carry a complete stock and can make prompt shipments. Send for our money saving catalogue.

Reflector & Hardware Specialty
Manufacturing Company
Western Ave. at 22nd Place, CHICAGO, ILL.



Every kind and form of
DRYING LUMBER

Grand Rapids Dry Kiln
QUALITY DRYING
Grand Rapids
Mich. - U. S. A.

chines, have made arrangements with H. W. Petrie, Limited, Toronto, to act as their agents in Ontario and Quebec. Mr. R. D. Emery, who has represented Baxter D. Whitney & Son, as well as other woodworking machinery manufacturers in Canada for the past year, is now connected with the woodworking machinery department of H. W. Petrie, Limited.

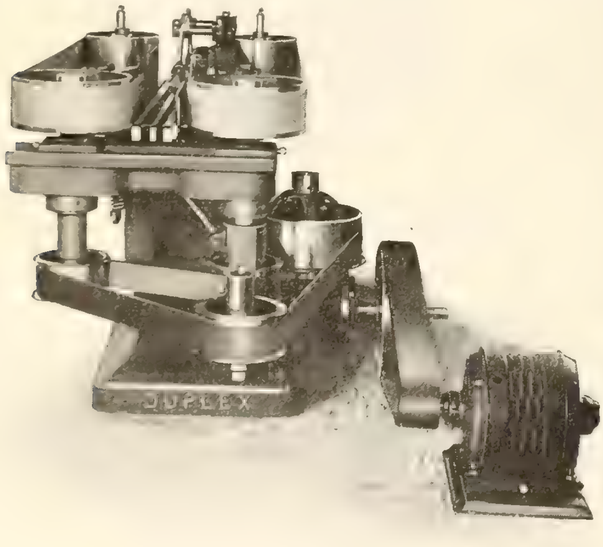
The Lewis Hardwood Company has secured a Dominion charter to carry on a lumber manufacturing and selling business, with head office at Lewiston, N.S., and authorized capital of $50,000. Those interested in the company include G. E. M. Lewis, and F. L. Lewis, of Truro, N.S., C. H. Andersen, of Lewiston, and John Lewis, of Brownville, Me.

A London, Eng., firm desires quotations and samples from Canadian manufacturers of three-ply birch wood or equal boards; 13⅛ in. x 10⅛ in. x 3-16 in. thick, delivery to be made in logs of 5, 10 and 20 thousand. Enquirers may obtain name and address of the firm by writing to the Department of Trade and Commerce, Ottawa, and quoting No. 1034 --Veneer.

Despite the curtailment of much of the export trade owing to the war it is encouraging to learn that the North America Bent Chair Company, Owen Sound, has been steadily continuing shipments of manufactured goods to New Zealand at the present time. The continuance of export trade should increase immeasurably the facilities for keeping our furniture factories busy during the slack season.

Duplex Double Edge Sander

A combination Belt Sander for sanding two edges from ¾-inch up to 9 inches in width and from 0 to 4 inches in thickness, with a continuous feed from 28 to 40 feet per minute. This machine has been specially designed for rapid sanding of two edges with a continuous feed, with three changes of speed similiar to a moulder. The belts have a reciprocating motion of 1-inch to 0, to suit the condition of work and the width of belt that is used upon the work.



New Duplex Double Edge Sander.

Various attachments are furnished with this machine, such as table for outside hand sanding, small roll for curve sanding and angle bars for one face sanding. Adjusting the machine to the different work is very simple; also the construction of the whole mechanism, as the most practical ideas have been used in sanding two edges in one operation.

The machine is built by the Duplex Moulding Sander Company, Hornell, N.Y.

Business Notes

Two Toronto men, Messrs. Watt & Gibson, are said to be contemplating the building of a planing mill and lumber yard at North Regina, Sask., at an estimated outlay of $15,000.

A London, Eng., furniture firm wishes to hear from Canadian furniture manufacturers in a position to supply bentwood chairs, office and flat desks. Name and address of firm can be obtained from the Enquiries Branch, Department of Trade & Commerce, Ottawa.

An English company manufacturing matches is desirous of obtaining supplies of suitable matchwood, preferably aspen, from Canada. The company would like to get into touch with Canadian shippers who are in a position to quote for their requirements. Further information can be obtained by communicating with the Enquiries Branch, Department of Trade & Commerce, Ottawa.

A firm of timber merchants in the English Midlands requests to be placed in communication with Canadian manufacturers of wooden panels of all kinds; a London, England, firm seeking large supplies of split wood pulleys for machinery transmission invites offers from Canadian manufacturers, and a London manufacturing company wishes to get into touch with Canadian manufacturers who can supply frames for hammock chairs. The company will contract for large quantities and upon receipt of samples and prices are prepared to place an order for 5,000 for delivery in January. Information regarding the location of these firms can be obtained from the Enquiries Branch, Department of Trade & Commerce, Ottawa.

Veneer Press Agency

If you are interested in securing an agency for a high grade veneer press now manufactured and sold largely in the United States, write us. Catalogue will be sent you on request and we will arrange interview in Toronto or Montreal as desired. Reply to Box 40, Canadian Woodworker, 345 Adelaide Street West, Toronto, Ontario. 11-12

Salesman's Opportunity

We want to get in touch with a good live Salesman who has a line of domestic veneers and would be willing to handle mahogany and Circassian walnut also. Commission basis believed to be best arrangement, but would gladly consider any proposition made. Write at once, giving particulars of experience and connection. Box 39, Canadian Woodworker, 345 Adelaide Street West, Toronto, Ont. 11-12

Hardwood Salesman Wanted

Wanted a high grade Hardwood Salesman who is thoroughly acquainted with the furniture, piano and interior finish trade of Canada. We can offer such a man an exclusive territory in a well established line. Send full particulars and references in first letter or application will not be considered. Address Box 38, Canadian Woodworker, 345 Adelaide Street West, Toronto, Ont. 11-12

WOODWORKING MACHINERY

More than 1,000 Second-hand Machines, Renewed and Guaranteed.

52 Lines of New Machinery the Largest Stock in the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc., 1219-1227 Washington Blv'd. CHICAGO, Ill., U. S. A.

"Andrews" Dried Lumber IS BETTER LUMBER

"ANDREWS" Products Represent
Perfection—Reliabilty—Results

"Andrews" Moist Air Lumber Driers

CONDENSING
or
VENTILATED

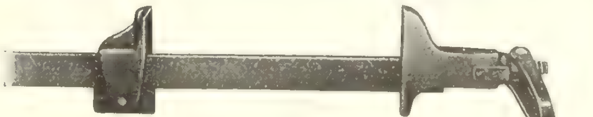
Perfect Transfer Cars
Perfect Dry Kiln Trucks
Canvas Dry Kiln Doors
Double and Single

Write for Information

DRIER DEPARTMENT

The A. H. Andrews Co.
115-117 South Wabash Ave.
CHICAGO

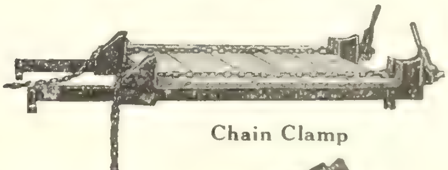
"Pioneer" Moulding Sander Power Veneer Presses



Cabinet Clamp

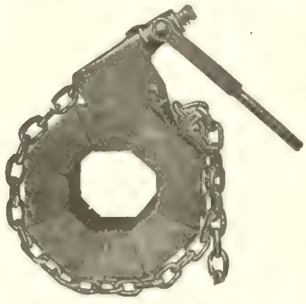
Veneer Press

Write for Catalogue and Prices



Chain Clamp

Black Bros. Machinery Co.
Mendota, Ill.



Column Clamp

Plain Sawed Oak

Mills in West Virginia and Kentucky

Wilcox & Knapp
Conneautville, Pa.

Quotations Cheerfully Furnished

BUSINESS AS USUAL

Your Inquiries Solicited for

Pine, Spruce, Hemlock, Hardwoods, Lath

Good Stocks Prompt Shipments Satisfaction

C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL

The Atlantic Lumber Co.

Manufacturers and Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers - TORONTO
Phone Main 6386

HOME OFFICE, BOSTON, MASS.

Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

Archer Lumber Company

HARDWOOD LUMBER

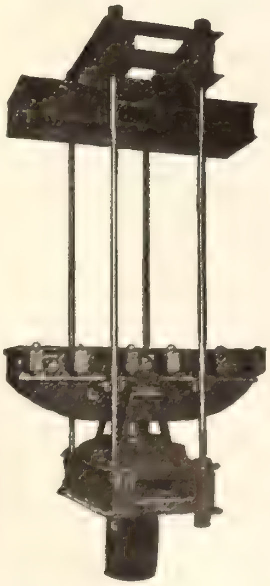
Helena, Ark.

PLAIN RED GUM		QTRD. RED GUM	
4/4 1s & 2s	171812	4/4 1s & 2s	12000
4/4 No. 1 C.	433970	4/4 No. 1 C.	49187
5/4 1s & 2s	46339	5/4 1s & 2s	12530
5/5 No. 1 C.	30140	5/4 No. 1 C.	15682
6/4 1s & 2s	37375	6/4 1s & 2s	10000
6/4 No 1 C.	71172	6/4 No. 1 C.	27584
8/4 1s & 2s	36237	8/4 1s & 2s	10000
8/4 No. 1 C.	31552	8/4 No. 1 C.	5600

SAP GUM

4/4 13-17 in. Boxboards	28718
4/4 18 in. and up Panel	33905

Hydraulic Veneer Press

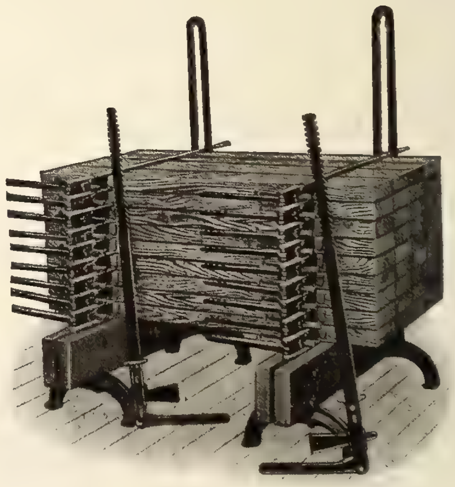


We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

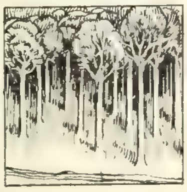
CLAMPS THAT CLAMP



We make a complete line of clamps for the glue room, Efficient — Economical — Durable. Built to serve well and last long.

Send for Complete Catalogue

A. E. PALMER & SONS
OWOSSO, MICH.



INDIANA HARDWOODS

Write for a quotation on this space
it will put you in touch with
hardwood consumers

The
Powell-Myers Lumber Co.
South Bend, Ind.

Anything and Everything in
Hardwoods
cut to your order

OUR SPECIALTIES
Oak, Ash, Hickory, and Poplar Dimension
Red and White Oak Car Stock
White Oak Timbers, White Oak Bridge Plank
Oak Reaches, Oak Poles
Chair, Table and Implement Stock
Oak Bending Plank

SEND US YOUR ENQUIRIES

J. V. STIMSON

All kinds of

Hardwood

Lumber

MANUFACTURED

HUNTINGBURG - INDIANA

Mills at ***Owensboro, Ky.,*** and
Memphis, Tenn.

Buyers of Hardwood Lumber

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker." They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OHIO
Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY

Cincinnati, Ohio

OAK

4/4, 5/4, 8/4, 12/4 and 16/4 No. 1 Com. and Fas.

DIMENSION STOCK

We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT

4/4 and 6/4 all grades.

BASSWOOD

4/4 and 5/4 Log Run

YELLOW PINE

5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller Lumber & Veneer Co.

CINCINNATI -:- OHIO

Manufacturers of

Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.

CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR

Extra Wide 1, 2, 3 and 4 inch 5/8" PANEL STOCK
6" x 6," 7" x 7" and 8" x 8" Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati, O.

ANY CHANGE

In the map of Europe will in no way affect the color or texture of our lumber. It will always be the same uniform, soft textured, even (white) colored stock as before.

Our Own Timber — Our Own Mills — Our Own Organization

The Mowbray & Robinson Company

"Manufacturers"
Cincinnati, Ohio

YARDS: Detroit, Mich.
Rochester, N. Y.
Brooklyn, N. Y.
Cincinnati, O.

MILLS: Quicksand, Ky.
West Irvine, Ky.
Viper, Ky.
Hombre, Ky.

OHIO

Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO

Mills:
Kentucky Tennessee
W. Virginia

—We make a specialty of—

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chestnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills. Write us today and send us your inquiries.

Immediate Shipment

West Virginia Stock

Thoroughly Dry and Well Manufactured

1 car 4/4 1s and 2s, Plain White Oak.
4 cars 4/4 No. 1 Common Plain White Oak.
2 cars 4/4 No. 2 Common Plain White Oak.
1 car 4/4 No. 1 Common and Better Plain White Oak.
Worm holes no defect.
1 car 6/4 No. 1 Common Plain White Oak.
6 cars 4/4 S. W. Chestnut.
1 car 5/5 S. W. Chestnut.
4 cars 6/4 S. W. Chestnut.
1 car 8/4 S. W. Chestnut.
3 cars 4/4 No. 3 Common Chestnut.
1 car 4/4 No. 1 Common and Better Chestnut.
½ car 8/4 No. 1 Common and Better Chestnut.
1 car 4/4 Saps and Select Poplar.
2 cars 4/4 No. 2 Common and Better Poplar.
1 car 5/4 No. 2 Common Poplar.
1 car 6/4 No. 2 Common Poplar.
1 car 4/4 No. 2 Common and Better Birch.

We solicit your inquiries on special cut bill Oak.

Mill at Holly Junction, W. Va.

Write at once for Quotations. **The Price is Right.**

The Imperial Lumber Co.

Columbus, :-: Ohio.

DUHLMEIER BROTHERS

Mills—TENNESSEE ARKANSAS **Main Office & Yard—CINCINNATI, OHIO, U. S. A.**

OAK and RED GUM

OUR SPECIALTY

Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

At our Tennessee mill we are producing some choice Band Sawn

Plain and Quartered Red and White Oak, Poplar

Mahogany

Prompt Shipments and High Grades our Hobby. Let us quote you on your requirements.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

ABRASIVES
The Carborundum Co., Niagara Falls, N.Y.

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.

BAND SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.

BAND SAW STRETCHERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BLOW PIPING
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.

BOX MAKERS' MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CLAMPS
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

DOVETAILING MACHINES
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

DUST SEPARATORS
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

EDGERS (Gang)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

END MATCHING MACHINE
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

EXHAUST FANS
Invincible Blow Pipe Company, Toronto.
Sheldons Limited, Galt, Ont.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Son, Baxter D., Winchendon, Mass.

FILLERS
German-American Stain Co., Grand Rapids,
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GARNET PAPER AND CLOTH
The Carborundum Co., Niagara Falls, N.Y.

GRAINING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Black Bros. Machinery Co., Mendota, Ill.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE ROOM EQUIPMENT
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS, HAND AND FOOT POWER
The Carborundum Co., Niagara Falls, N.Y.

GRINDERS (Knife)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GRINDING WHEELS
The Carborundum Co., Niagara Falls, N.Y.

GROOVING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Pyribil Machine Co., P., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Archer Lumber Co., Helena, Ark.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Imperial Lumber Co., Columbus, Ohia.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Kraetzer-Cured Lumber Co., Moorhead, Miss.
Mowbray & Robinson, Cincinnati.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Prendergast Co., Cincinnati, Ohio.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Spencer, C. A., Montreal.
Wilcox & Knapp, Conneautville, Pa.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.

KNIVES (Planer and others)
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Galt Knife Co., Galt, Ont.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

MACHINE KNIVES
Berlin Machine Works, Ltd., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

MITRE MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Marietta Paint & Color Co., Marietta, Ohio.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.

PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

RESAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P. Q.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SANDERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Duplex Moulding Sander Co., Hornell, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SAW GUARDS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pyribil Machine Co., P., New York.

SAW GUMMERS, ALOXITE
The Carboroundum Co., Niagara Falls, N.Y.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

SAW JOINTERS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Pyribil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHARPENING TOOLS
The Carborundum Co., Niagara Falls, N.Y.

SHAVING COLLECTORS
Invincible Blow Pipe Co., [illegible]
Sheldons Limited, Galt, Ont.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Berlin Machine Works, Ltd. Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

TRIMMERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Central Veneer Co., Huntington, W. Virginia.
Cincinnati Veneer Company, Cincinnati, Ohio.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dupre & Company, C., Toronto.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Wisconsin Seating Co., New London, Wisconsin.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Company, Montreal, P.Q.

WAGON AND CARRIAGE MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WHEELS, Grinding, Carborundum and Aloxite
The Carborundum Co., Niagara Falls, N.Y.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

WOODWORKING CUTTERS
Galt Knife Company, Galt, Ont.

YELLOW PINE
Prendergast Co., Cincinnati, Ohio.

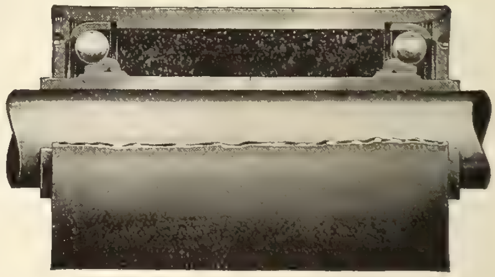
The Glue Book

What It Contains:

Chapter 1—Historical Notes
Chapter 2—Manufacture of Glue
Chapter 3—Testing and Grading
Chapter 4—Methods in the Glue Room
Chapter 5—Glue Room Equipment
Chapter 6—Selection of Glue

Price 50 Cents

Woodworker Publishing Co.
Limited
MacLean Building, Toronto



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

1913 Edition

"Practical Pattern Making"

A Practical Work on

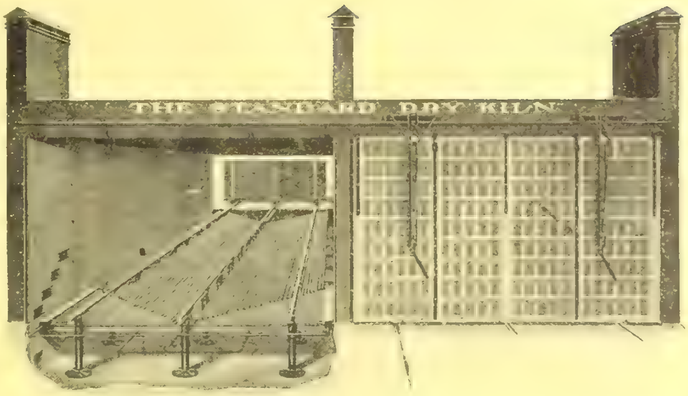
The Art of Making Patterns, written by a patternmaker with thirty years' experience. Contains information on Pattern Making and Pattern-Makers in general, also a detailed description of the necessary materials and how to use them. Then the tools, both hand tools and machine tools, with special chapters on the Lathes, the Band Saw and the Circular Saw, with many examples of work which may be done on these machines.

A complete section of illustrated examples of Pattern-Work in wood, with many pages of metal pattern-work, Gating and Plate work. Both Vibrator and Stripping Plates are shown. Specific instructions for plaster work are given, and finally, the cost, marking and record of patterns are explained and illustrated.

By F. W. BARROWS

Price $2.00

CANADIAN WOODWORKER
345 Adelaide St. West, TORONTO



THE GUARANTY
that goes with The Standard Dry Kiln

is a **real** one that protects the buyer and puts it up to the kiln to prove up all our claims. Every Standard Dry Kiln is **guaranteed** to dry a stated quantity of stock and to bring the stock out in a perfectly satisfactory condition—whatever the variety of the lumber may be.

Write for the catalog and our 64-page book, "Users of The Standard Dry Kiln and What They Say." Address: The Standard Dry Kiln Co., 1560 McCarty St., Indianapolis, Ind.

PERKINS
VEGETABLE GLUE

Is better than any glue made for built-up-stock and veneer laying.

It is applied without heat and does away with heat in the glue room.

It is being used by many of the largest manufacturers of high-class furniture in this country.

We can save you 20% of your present glue bills and give you better work besides.

If you are interested or doubt anything we have said, drop us a line. We will send you full particulars and give you the names of some of our customers—in the same line as you —who will be glad to give you their frank opinion.
Go into this matter right now, while you think of it.

It's worth investigating

Perkins Glue Co.
809 J.M.S. BLDG.
SOUTH BEND
INDIANA

We can supply immediate orders *for* UNIFUME *and* FUMED OAK ACID STAINS at regular prices.

But there is likely to be a war shortage and we advise prompt action if you want to take advantage of present prices.

UNIFUME is a fuming liquid. Applied on new wood it is colorless. After drying it may be treated with fumed oak acid stain, which will give the entire article stained a uniform nut brown shade, regardless of the different kinds of wood used in its construction. It also evens up all sap streaks.

MARIETTA
WOOD
FINISH
SPECIALISTS

The Marietta Paint & Color Co.
Marietta, Ohio.

December Essay Contest Awards—See page 10

CANADIAN WOODWORKER and Furniture Manufacturer

Behind this name there is a record of achievement second to none

WHITNEY Single and Double Surface Planers

have for years been the standard of excellence in planing machines.

There is no better verification of what we say than the authoritative statements of those leading wood-workers who found that installing a Whitney brought them increased output and smooth, even surfacing, produced at the low notch cost.

Why not take up the matter with us and determine why a Whitney Surfacer equipped to suit your planing is better than any other Planer?

Whitney Motor Driven Surfacers with Motors coupled to the Cutter Heads save power, eliminate belts, do away with Countershafts and Loose Pulleys.

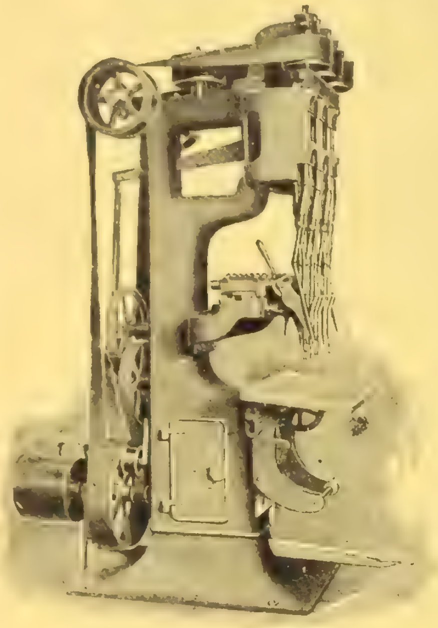
BAXTER D. WHITNEY & SON - Winchendon, Mass.

California Office: Berkeley, California
North Pacific Coast Office:
Stetson-Ross Machine Works, Seattle, Wash.

Canadian Representatives:
H. W. Petrie, Limited
Toronto, Ontario

Volume Fourteen TORONTO, DECEMBER, 1914 Number Twelve

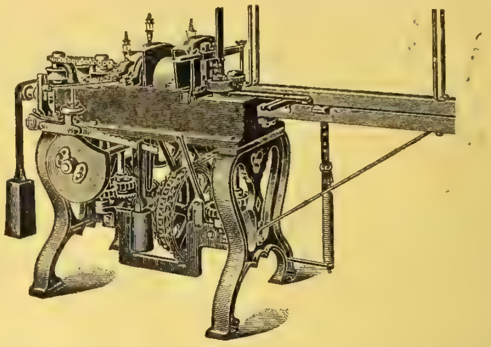
CHEAPER and BETTER BORING



can be done by the use of my Multiple Spindle Boring Machines. Twelve holes or less are bored at once, in a straight line, parallel lines, staggered, zig-zag, in a circle or almost any position, one inch center to center or 24 ins. apart, any angle up to 35 degrees.

Ask for details.

J. M. NASH, Milwaukee, Wis.



The OBER NO. 10 LATHE AND AUTOMATIC SANDER

make an excellent outfit for **Broom Handles** and **Other Straight Handles.**

We also make **Lathes** for turning irregular work, **Sanders, Shapers, Rip** and **Cut Off Saws, Etc.**

THE OBER MFG. COMPANY
CHAGRIN FALLS, O., U.S.A.

Write for free catalogue No. 31

MAKING A GOOD SANDER A BETTER SANDER

The better the quality of the paper or cloth that you use—the faster and cleaner it cuts—the longer it lasts, the more efficient will be the sanding machine.

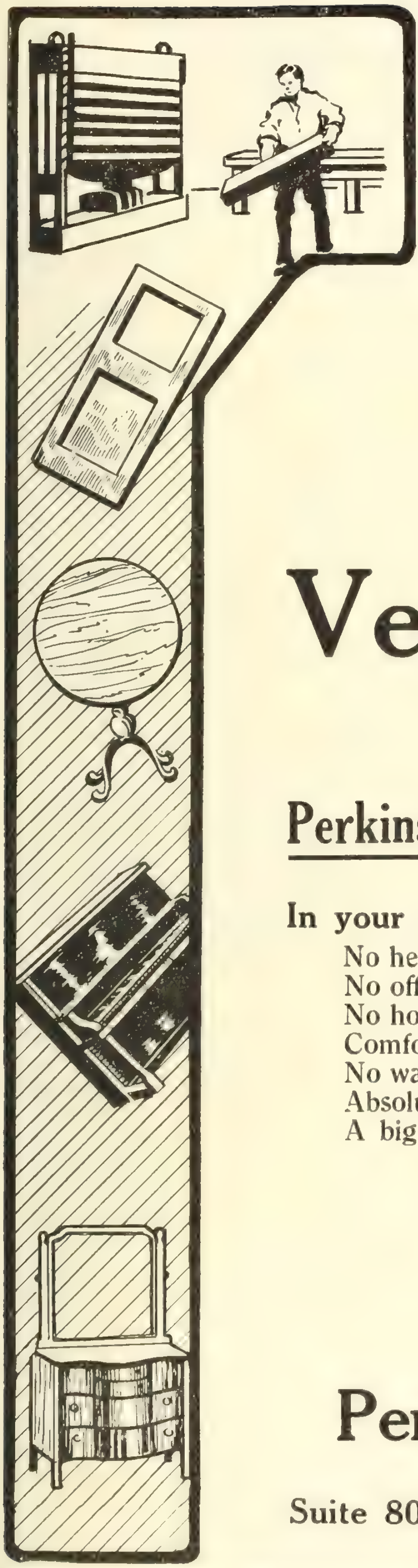
Carborundum Brand Garnet Paper and Cloth

Cut clean and fast—they are uniformly coated with the purest, sharpest of garnet grain.—They are products that make a good sander a better sander.

Working Samples on request

The Carborundum Company
NIAGARA FALLS, N. Y.

BOSTON NEW YORK PHILADELPHIA PITTSBURGH
CLEVELAND CINCINNATI GRAND RAPIDS CHICAGO
MILWAUKEE MANCHESTER, ENG. REISHOLZ, GER.



Glue Room Economy

When You Use

Perkins Vegetable Glue

You will have

Perkins Quality - Absolutely Uniform

In your glue room

- No heat for application
- No offensive odor
- No hot cauls
- Comfortable temperature
- No waste glue
- Absolute uniformity
- A big saving in cost

In your product

- Veneers laid to stay
- Unaffected by climate
- No blisters from standing
- Will stand ocean voyage
- Dependable results
- Highest quality
- Repeat orders

We prove it in your own factory

Our Canadian representative will call and explain our proposition

Perkins Glue Company

Originator and Patentee of Vegetable Glue

Suite 809 J.M.S. Bldg. - South Bend, Indiana

Perkins Glue

Alphabetical List of Advertisers

Andrews Company, A. H. ... 43
Archer Lumber Company ... 45
Atlantic Lumber Company ... 45
Ault & Wiborg Company ... 33

Berlin Machine Works ... 5

Canadian Boomer & Boschert Mfg. Co. ... 7
Canadian Morehead Manufacturing Company ... 51
Carborundum Company ... 2
Central Veneer Company ... 39
Chapman Double Ball Bearing Company ... 50
Chicago Machinery Exchange Inc. ... 43
Cincinnati Veneer Company ... 38
Clark Veneer Company, Walter ... 38

Dennison, Herbert, J. S. ... 41
DeVilbiss Manufacturing Company ... 33
Duhlmeier Brothers ... 47
Duplex Moulding Sander Company ... 7
Dupre & Company, C. ... 8

Galt Knife Works ... 8
Goshen Veneer Company ... 38
Grand Rapids Hand Screw Company ... 43
Grand Rapids Veneer Works ... 41

Hoffman Bros. Company ... 37
Huddleston-Marsh Company ... 37
Huther Bros. ... 7

Imperial Lumber Company ... 47
Invincible Blow Pipe Company ... 41

Kosse. Shoe & Schleyer Company ... 46
Kraetzer-Cured Lumber Company ...

Lightfoot, Stanley ... 41

Marrietta Paint & Color Company ... 52
Meakins & Sons ... 33
Morton Dry Kiln Company ...
Mowbray & Robinson ... 46

Nash, J. M. ... 2
National Securities Corporation ... 41

Ober Manufacturing Company ... 2
Ohio Veneer Company ... 37

Penrod Walnut & Veneer Company ... 39
Perkins Glue Company ... 3
Perrin & Company ... 45
Petrie, Limited, H. W. ...
Prendergast Company ... 46
Pryibil Machine Company, P. ... 7

Reflector & Hardware Specialty Mfg. Company ... 41
Robertson Manufacturing Company, P. L. ... 8

Scientific American ... 41
Shawnee Lumber Company ... 47
Sheldons Limited ... 42
Shiels & Company, Chas. F. ... 46
Simonds Canada Saw Company ...
Spencer, C. A. ... 43
Standard Dry Kiln Company ... 51
Stimson, J. V. ... 45

Talbot-Zoller Lumber & Veneer Company ... 46
Thompson Hardwood Lumber Company ... 47

Whitney & Son, Baxter D. ... 1
Wilcox & Knapp ... 43
Wisconsin Seating Co. ... 39

BOOKS FOR SALE

The following books are offered at special prices subject to previous sale:

Saw Fitting Manual, a treatise on the care of saws and knives. Deals with everything in the saw and knife alphabet, from adjustments to widths. 144 pages. Price $2.00.

Common-sense Handrailing, by Fred T. Hodgson. Published by Frederick J. Drake & Company, Chicago. 114 pages, illustrated. Price 50c.

oof Framing Made Easy, by Owen B. Maginnis. Published by The Industrial Publication Company, New York. 164 pages, illustrated. Price 50c.

Handrailing Simplified, by An Experienced Architect. Published by William T. Comstock, New York, 52 pages, illustrated. Price 50c.

How to Join Mouldings; or, The Arts of Mitering and Coping, by Owen B. Maginnis. Published by William T. Comstock, New York. 72 pages, illustrated. Price 50c.

The Book of Lumber Shed Construction, by Met. L. Saley. Published by American Lumberman, Chicago. 176 pages, illustrated. Price $1.00.

Furniture Designing and Draughting, by Alvan Crocker Nye. Published by William T. Comstock, New York. 100 pages, illustrated. Price $1.00.

Popular Mechanics Shop Notes, Published by Popular Mechanics, Chicago. Easy Ways to do Hard Things, etc. Years 1905-1906-1907-1908. Price 40c each.

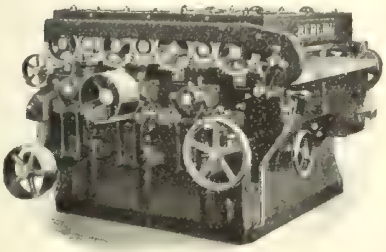
Cabinet Making, by J. H. Rudd. Published by Grand Rapids Furniture Record Company. 210 pages, illustrated. Price $1.50.

Woodworker Publishing Company, Limited
MacLean Building, Toronto, Ontario

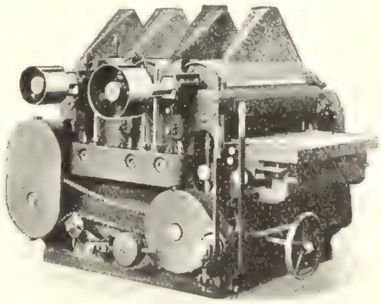
Fatten up the Gobbler, Men, Christmas is Almost Here.

We aren't terribly strong on sentiment, men. We're a blamed sight more handy at telling you good things about Berlin Sanders than we are at passing along the "Here's-wishing-you-a-Merry-Christmas-and-a-Happy-New-Year" stuff.

But that's what we want to do here—to wish every mother's son of you the Merriest Christmas that you have ever known. And in wishing you a Happy New Year we're just going to put in the word prosperous—wishing you a Happy and Prosperous New Year.



Do you know why there are more Berlin Sanders in operation than all others combined?—Any owner will tell you.



Your Best New Year's Resolution

Get right on your sanding proposition. Start the New Year with economizing tools. Make the quality of your sanding a lasting selling force and the economy with which it is done a means to your business growth. When it comes to wishing yourself a prosperous New Year, you'll find nothing will clinch your wish surer than a Berlin Sander installation. A Roll-feed sander for your large work and an Endless-bed for your smaller work.

Fatten up your bank account with the savings these tools will give you and next Xmas you'll have a better killing than this year's turkey.

Berlin Machine Works, Limited

Plants at Hamilton, Can. and Beloit, Wis., U. S. A.

World's Largest Manufacturers of Woodworking Machinery

A Forceful Factor

¶ The trade paper is to-day a forceful factor in the commercial world. It is performing a service which is of almost incalculable benefit to the field it represents and the country at large. Its object is to instruct and educate—to furnish trade and technical information which cannot be found in newspapers.

¶ Canada possesses more trade papers per capita than any other country in the world. This is a matter for congratulation. Her progress in recent years would not have been so great but for the influence of the trade press.

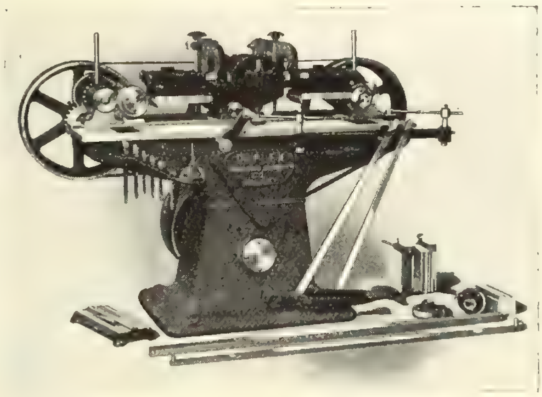
¶ The Canadian Woodworker is a specialized trade paper. The woodworking and furniture factories represent its field. It furnishes information chiefly of a practical character. Its subscribers are the managers, superintendents, foremen, and men desiring to learn more of the business in which they are engaged.

¶ In many factories the Canadian Woodworker has several subscribers. Why? Because the managers have encouraged the reading of trade journals. That is modern business management—the kind that ensures success.

¶ The one copy which YOU now receive may not be sufficient for 1915. It is an advantage to have new orders start with the first of the year.

The Canadian Woodworker
345 Adelaide St. West, Toronto, Ont.

Irregular Surface Sanding and Polishing Machine



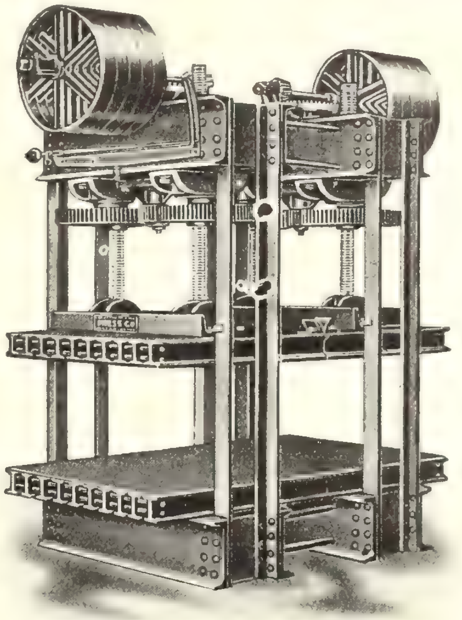
The only machine that will sand mouldings with irregular shapes and fine sharp members at a high speed without injury to the lines. Has been in practical use over two years in the largest mills in this country and abroad. **Oliver Machinery Co., Limited, Manchester, England, Foreign Agents.**

We also manufacture a special line of Belt Sanders for double edge and surface sanding.

Manufactured by

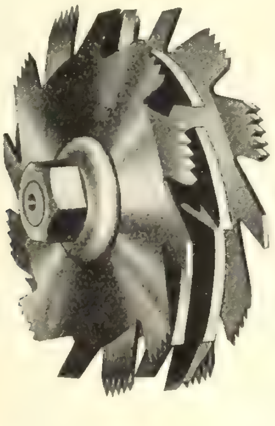
The Duplex Moulding Sander Co.
Hornell, N. Y., U. S. A.

VENEER PRESSES



WRITE FOR BULLETIN C 1.

Canadian Boomer & Boschert Press
Company, Limited
18 Tansley Street, MONTREAL



Patented Nov. 29, 1890
July 19, 1912

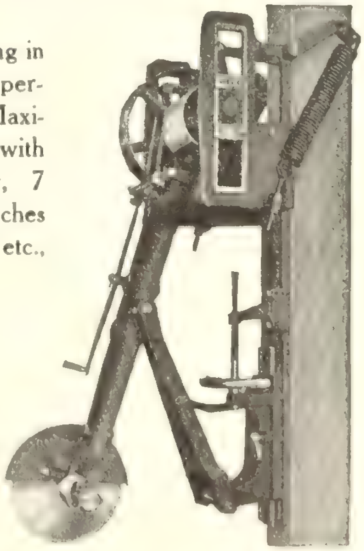
A Huther Dado Head will cut perfect grooves, any width, with or across grain. Can be used on any saw mandrel or saw rig. Has rapid, no-screw adjustment. Sent on approval and may be returned if not satisfactory.

A. R. Williams Machy. Co. Toronto — Canadian Agents — Williams & Wilson Montreal

Huther Bros. Saw Mfg. Co.
Rochester, N.Y., U.S.A.

PRYIBIL No. 5 Parallel Saw and Groover

This saw does not swing in an arc, but travels in a perfectly straight line. Maximum cut in one stroke with 20-inch diameter saw, 7 inches deep and 26 inches across. In tenoning, etc., remaining margin is the same thickness irrespective of thickness of lumber. Specially adaptable for gaining, grooving and rabbeting.



P. Pryibil Machine Co.
512-524 W. 41st St., - New York City
Represented by: Chicago Machinery Exchange
1219-1227 Washington Boulevard, Chicago

If interested in Woodworking Machinery, Write us.

3-PLY WOOD

Probably the last chance to secure 3-ply Alderlite as our present stock is almost depleted

ORDER NOW

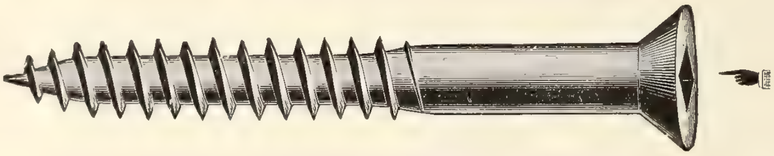
Sizes in Stock:—

60 x 40 x 4 m/m (3/16 in. scant)
49 x 41½ x 2 " " "

60 x 40 in 3/16 in full and ¼ in.
60 x 45 " " "
60½ x 49 " " "

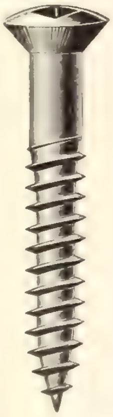
C. DUPRE & CO., 266-8 King Street West, TORONTO
Sole Agents, Venesta Limited, London, England

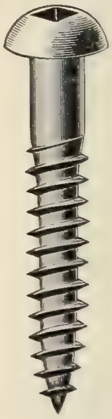
ROBERTSON SOCKET HEAD Wood Screws



See That Square Hole

Pat. Feb. 2, 1909





THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market. Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

P. L. Robertson Mfg. Co., Limited
MILTON :: ONTARIO

Good Steel, Carefully Manufactured, Scientifically Tempered

Our GLUE JOINT CUTTERS Make a Perfect Joint.
MILLED SHAPER CUTTERS—Any Size or Any Shape. Ask for quotations.

GALT KNIFE COMPANY, LIMITED 99 State Street, Galt, Ontario

Canadian Woodworker

A Monthly Publication in the Interest of the Woodworking Industry.
Reaches the factories producing interior finish, doors, sash, flooring,
woodenware, furniture, pianos, boxes, and general mill products.
Subscription, $1.00 a year; foreign $1.50.

Woodworker Publishing Company, Limited

Branches: Montreal, Vancouver,
Chicago, New York, London, Eng.

345 Adelaide St. West, Toronto
Phone Ade. 2700

Authorized by the Postmaster General for Canada, for transmission as second class matter.
Entered as second class matter July 18th, 1914, at the Post Office at Buffalo, N.Y., under the Act of Congress of March 3, 1879.

Vol. 14 **December, 1914** **No. 12**

The British Market for Pianos

CONSIDERABLE attention is being given at the present moment to the prospect of opening up an extensive market for the disposal of Canadian-made pianos in Great Britain. It has been shown by statistics quoted a few weeks ago by the Department of Trade and Commerce, Ottawa, that nearly 90 per cent. of the pianos imported into Great Britain have been of German manufacture. This fact is certain to have a material bearing on the future possibilities of the trade, as it may be assumed that for many years to come few people in the United Kingdom will feel disposed to purchase pianos bearing the hall mark of the German manufacturer. The stoppage of supplies from Germany has laid open the opportunity for the British Manufacturer. It is only to be expected, therefore, that he will take full advantage of the opening for trade extension, hoping to make up the greater portion of the deficiency by increased production within the country. The British people have hitherto been accustomed to a variety of pianos of foreign make, and it will not be easy to persuade them to change their tastes in a night and to accept fresh designs. The only course by which Canadian manufacturers might adequately test the possibilities of the market would be to send over a qualified representative who could thoroughly inspect conditions, and if the prospects were considered favorable such permanent arrangements could be concluded as might be found desirable. The methods adopted by the German and other foreign houses doing business with the United Kingdom have been to obtain an influential agency capable of gaining access to dealers and retailers. The alternative, of course, would be to open an office and warehouse. Up to the present, practically all the leading agents have handled German pianos, and this has proved an obstacle to Canadian makers wishing to cultivate the United Kingdom trade. With the stoppage of supplies from Germany, and the practical break up of future German business, many of these agents must seek new sources of supply, and there is every likelihood that one or more of them will be prepared to take up a Canadian agency.

Hitherto the shape and appearance of both Canadian and American pianos have been an obstacle to the transaction of business with the United Kingdom. If Canadian manufacturers desire to obtain a footing in that market they would be well advised to manufacture instruments specially for the British trade in accordance with the designs in favor there. It is pointed out by the editor of one of the leading British music trade journals that Canadian piano manufacturers should be able to transact a fairly large business with the United Kingdom, providing they are prepared to adapt themselves to the requirements and methods of the country. We heartily commend the suggestion to the careful consideration of Canadian piano manufacturers. We are sure that they will leave nothing undone to get after what is likely to prove an exceedingly profitable business proposition.

Dominion Charters Upheld by Privy Council

THE recent decision of the Privy Council in the case of the John Deere Plow Company v. Duck, and Wharton v. The John Deere Plow Company, clears up, to a very great extent, a number of uncertainties which have surrounded the matter of Dominion and Provincial Companies' licenses ever since Confederation. The chief result of the decision is the establishing of the paramount jurisdiction of the Dominion over trade and commerce, making it definitely clear that a company which has secured a Dominion charter may carry on business in the various provinces of Canada without the necessity of taking out anything in the form of a Provincial charter. Manufacturers and other commercial companies operating in Canada who are well advised, will, as a result, henceforth take out Dominion charters and ignore Provincial licensing acts. In order to understand the situation clearly, it is necessary to refer

CHRISTMAS, 1914

Happiness and Prosperity in Season, with Charity in All

briefly to the cases upon which judgment has been given by the Privy Council.

The John Deere Plow Company was incorporated under a Dominion charter, with head office in Winnipeg, and authorized to carry on business in agricultural implements throughout Canada. The case of the Company v. Duck was an action for breach of contract to accept delivery of certain implements which Duck had ordered, but afterwards refused to take, alleging that the Company, having no license in British Columbia, could not proceed against him. The Company claimed that its Dominion charter was all that was necessary to enable it to carry on business in any province. The case of Wharton was a friendly action asking for injunction to restrain the Company from carrying on business in British Columbia, on the ground that such business would be illegal because the Company had no Provincial license. Both cases were tried in the Supreme Court of British Columbia and decided against the Company. Appeal was then taken to the Privy Council.

The judgment is very sweeping and declares that the clauses of the British Columbia Act under consideration are invalid because they interfere with the powers conferred on the Company by the Dominion Parliament, and with the Company's status in the Courts. The judgment applies equally to the extra-Provincial licensing and registration acts in Ontario, Manitoba, Alberta, Saskatchewan, New Brunswick, Nova Scotia and the Yukon. The Act of the Province of Quebec specifically excepts Dominion companies, and is, therefore, unaffected. The Act of Prince Edward Island is of a different character, and is also unaffected.

Briefly, therefore, the situation is as follows:—

To do business throughout Canada a Dominion charter alone is necessary.

A province can no longer compel a company with a Dominion charter to obtain a Provincial license or to be registered in the province as conditions of exercising its powers or of suing in the Courts.

The opinion of the Privy Council is definitely ascerted in the following references to the provisions of the British Columbia Companies' act which were under discussion:—"Their Lordships think the legislation in question really strikes at the capacities which are natural and logical consequences of incorporation by the Dominion Government of companies with other than Provincial objects."

Awards in the Canadian Woodworker Essay Competition

No. 2 (December)

High Standard of Articles Maintained and Even Surpassed—A Representative Competition Which Marked a Numerical Increase of Fifty Per Cent.

THE growing interest taken in this feature of the work of the Canadian Woodworker is shown by the greatly increased number of Essays submitted in the December Contest. It is both gratifying and encouraging to be able to report that this increase was more than fifty per cent. Articles were received from all parts of Ontario, from points as far east as Amherst, west from Winnipeg, and other places. We find that this was attributable to the popularity of the lines upon which the competitions are conducted, and we acknowledge, with many thanks, this endorsation of those who kindly co-operated by submitting essays.

In submitting their report, the Judges extend their congratulations to the writers of the articles for their intimate knowledge of their respective subjects. These subjects cover a wide range, embracing nearly every activity in the woodworking field. The general excellence of the contributions rendered the matter of adjudication somewhat difficult, but on the basis of awarding the prizes to the writers of those articles of the most general interest and benefit to the trade, the First Prize of TWENTY DOLLARS goes to

Mr. Kenneth McGilvray, Dundas, Ontario,
for his Essay on
"ESTIMATES AND QUANTITIES"

This article, which is reproduced in this issue, is awarded first place on the ground that it deals with a subject of great general interest, but one which is sadly neglected in the training of the ordinary woodworker. Mr. McGilvray speaks out of a wide practical experience, and the manner in which he illustrates his article by figures and costs makes it of outstanding value. He advances a plea for the preparation of bills of quantities, and endeavors to show the particular inefficiency of the Canadian trade in this respect. While it does not follow, necessarily, that we are altogether in accord with Mr. McGilvray's statements, we believe that the general principles of his arguments are sound.

The Second Prize of TEN DOLLARS goes to

Mr. Albert Hudson, Hespeler, Ont.
for his Article,
"Built-Up Stock Veneer, With Pointers on Laying."

This article, which is published in the Veneer Department of this issue, throws considerable light on one of the hardest departments of the trade. The rapid extension of this field in recent years attaches a well-defined value to practical articles dealing with problems of manufacturing or laying, and Mr. Hudson submits a paper which reflects an intimate knowledge of the important details of the work. His pointers on straightening out the veneer, jointing, assembling and gluing, cannot fail to be of value.

Articles to receive special commendation were: "A Mill-wrighting Problem Solved," by Mr. John W. Bailey, of Berlin, Ont.; "Practical Stair Work," by Mr. Robert J. Truax, of Chatham, Ont.; and "Planing Mill Costs," by Mr. A. W. McKenzie, Box 56, Norwood Grove, Winnipeg.

In addition to the two prize-winning essays, we reproduce in this issue the following articles submitted in the competition:—"The Refinishing of Antique Furniture," by Mr. Robert Ferguson, Toronto, "Practical Stair Work," by Mr. Robert J. Truax, Chatham; and "A Mill-wrighting Problem Solved," by Mr. John W. Bailey, Berlin, Ont.

It was not unusual for the early-day pioneers to build log cabins with few or no nails, but the custom has passed away in practically every part of this country. An interesting case of such houses has been discovered in the Canadian Northwest. An entire village has been so built by Ruthenian immigrants, who brought with them the peculiar building methods of their native country. The houses are of logs, with thatched pitch roofs. Even the doors, which are composed of slender twigs, woven and laced together, swing on home-made hinges and are latched with wooden hasps. The floor is of hewn logs, unnailed, while the roof is a fabric of poles and cross-woven wheat straw, ten inches thick, laid with such skill and care that the builders expect it to last twenty years.

Estimates and Quantities

First Prize Essay, Canadian Woodworker Competition No. 2

By Kenneth McGilvray, Dundas, Ont.

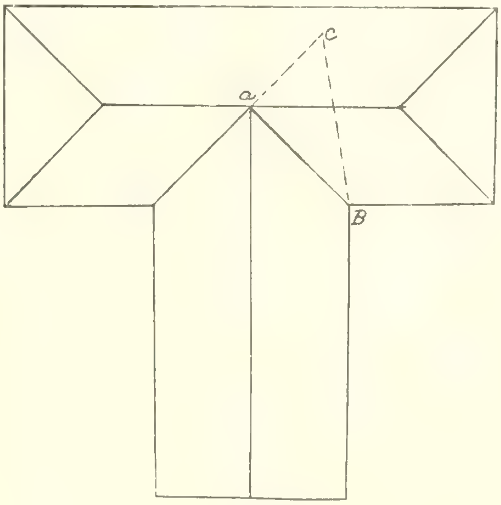
THE art of estimating is very important to the carpenter and the mill man, and he must have some system or method to work on in order to make his business a success. With a little practice almost any mechanic can take off the quantities of materials, but with the fixing of rates for the different classes and details of work, one requires to possess a wide knowledge and experience to make an accurate estimate of the time and labor necessary to complete a large job.

The measuring, or quantity taking, as it is called, leaves room for much improvement here in Canada and also in the United States. We are behind, especially in large contracts, in not having any standard or authorized measurements to work on. In England, Scotland, Ireland, Germany, France, Australia and South Africa we have recognized "Quantity Surveyors" who make out a bill of quantities. Tenders are then called for prices on these measurements. This really gives a definite quantity of work for a definite price, which is far better to all parties concerned than the century-old way here, where contractors often are not allowed much time to take off quantities accurately, and so cannot be expected to make a fair bid.

Another thing is the great waste of time, say, of ten millmen, all measuring off the same plan, and not more than two of them, perhaps, reading or interpreting it exactly alike; the majority competing among themselves to see who can take off the least quantity and some cutting it very fine. While in Trinidad, B.W.I., the writer has had occasion to notice the difference between the Old Country and the new in this respect, although it was not in the woodworking line, but in hollow brick or terra cotta work. The same set of plans for a building was sent to two different firms, one in England, the other in the United States, for prices on certain parts of the building. The English firm demanded a bill of quantities which afterwards was drawn up by a quantity surveyor in England and sent to the West Indies, while the United States firm made up their own quantities. When comparing the two it was found the United States bill had missed over 30 per cent. of the pieces required. A large proportion of such mistakes occur in the hurried figuring of the quantities by bidders, the misunderstanding or misinterpretation of plans and specifications, which in fairness to all parties to a contract should be made clear before the contract is let.

Personally, I favor the English system of having bills of quantities for all contracts above, say, $500, which would give safer bids and save disputes, the bidders all working from the same basis. None would be liable to omit or forget hardware, glass, etc., and so be the lowest, but at the same time a most incompetent bidder.

The lowest bid, which is usually the accepted one, is often the most inaccurate. Neither party to the contract could obtain any advantage over the other on quantity or description of the work. The estimator should be accurate and although he should endeavor to do "the maximum amount of work in the minimum of time," it should not be at the price of accuracy, as mistakes are not likely to be seen until it is too late to remedy the errors. A copy of all estimates made should also be kept for reference, as they form a basis on which to estimate any future work of the same class, besides acting as a medium for checking the job as it proceeds. It also saves time when ordering scantling, hardware, millwork, etc., as if it is a true Bill of Quantity all that has to be done is to look up that particular item in the estimate and order accordingly. It is understood that all measurements for calculating quantities and all information in regard to style of work and quality of materials to be used from the specification, are obtained from the drawings. At this point I would like to say that often an experienced estimator discounts the written requirements in places where perhaps his practical knowledge tells him something or other is unlikely to be insisted on, and tenders accordingly at a much lower rate than his deluded competitors, who suppose that the specification means what it says. But I think if anything is doubtful it is better to consult the architect and find out what is really required before tendering. Much could be written about a great many specifications which really say a great deal but tell you nothing.



Plan of roof.

I usually make up all quantities first, dividing each floor by itself and keeping all millwork by itself, but nearly all estimators have their own way in this respect. Secondly, I work up the costs against each item which I divide: first, cost of materials; second, cost of labor. The first can usually be fixed by using price books and lists giving current prices of materials. Many newspapers and nearly all large supply companies issue these, but the latter must be based on a fixed rate of wages per day. Then there are many rules and

The Second Prize Essay, **"Built-Up Stock Veneers, with Pointers on Laying,"** by Albert Hudson, Hespeler, Ont., is published in the Veneer Department of this issue. See page 34.

tables for measuring lumber, etc., and everyone has his favorite book, mechanic's or builder's guide. Some contractors use a method of estimating by the cubic foot in a building, but this is not a safe method by which to make a contract, although it does very well as a check on the true estimate.

The usual run is: small buildings, frame, costing $900 to $1,500—9 cents to 10 cents per cu. ft.; frame houses, up to ten rooms, costing $1,500 to $10,000—10 cents to 13 cents per cu. ft. This estimate is very often used by insurance companies to fix the amount to be placed on a building. It is also very good for giving an approximate price. Framing lumber is always measured by the super. ft. (or board foot as it is called in some places). That is 12 inches square and 1 inch thick. Thus a piece of material 2 in. x 10 in. x 18 ft. contains $\frac{18 \times 2 \times 10}{12} = 30$ ft. B.M., measuring studs. If they are to be set 16-inch centres as usual, allow one stud for each foot in length of partition, or if 12-inch centres make it the same, plus one-fourth. This is sufficient allowance to include sills, plates, and double studs at returns. This same rule may be used for finding the number of joists, rafters, tie beams, etc. The beginner at estimating often wastes much time figuring these items, but the above rule is the simplest and best that I have tried, although there are many others. For bridging the best way is to allow 4 cents per pair to furnish and set. Sheathing, if measured all the surface, making no allowance for doors and window openings, will come about correct, as what comes out for these openings allows for waste in cutting.

The same rule will apply to rough flooring, but add 10 per cent. more for waste if it is laid diagonally. Matched flooring has to be allowed 25 per cent. more than the measure to allow for groove and tongue and waste. Thus a piece of 1 in. x 6 in. flooring is actually ⅞ in. x 5⅝ in., and if the flooring is 1⅛ in. it has to be measured 1¼ in. B.M. In this case you would allow 50 per cent. over the exact measurement, i.e., 25 per cent. for groove and tongue and 25 per cent. to bring it to B.M. or super. feet; but some districts in Canada sell the flooring at different prices for different thicknesses. It is also important to remember that if the flooring is less than three inches wide another 15 or 20 per cent. will have to be allowed, as the extra groove and tongue joints take more wood. Most contractors also allow another 5 to 8 per cent. for handling and fitting.

Another quick method of calculating flooring is by the square or 100 sq. ft., taking in joists, bridging, rough flooring, finished flooring, nails and labor at 50 per cent. of cost of materials. This works out in Ontario about $15 per square, or 15 cents per sq. ft., for a fairly good floor. For weather boarding the same allowance as for flooring is right, as instead of the groove and tongue the lap takes the allowance. For cornices, where there was a fair number of mouldings, I used to measure girth of cornice and allow one cent per inch of girth per foot, this to include all material and setting. This works out as close as one can have it in general work.

Any moulded work that goes through the mill is usually based on the rule of one cent per inch of section per lineal foot, with a percentage of from 20 to 60 per cent. less, according to work and grade of material. For example, baseboard, ⅞ in. x 8 in., would come one cent by 8 less 50 per cent. = 4 cents per lineal foot. Hardwood costs nearly double.

The quantity of work a man will do in a day varies considerably. Some cities, where conditions and everything else are good, will make a far greater showing of work than is possible in a small town. Then the number of hours has to be considered, although in one place you will have as much work done in an eight-hour day as in another place in ten hours. As a general rule for rough carpentry work, if the cost of all materials be added together and from 50 to 55 per cent. for labor allowed, you will be very near the actual cost. I have several different tables or rules for guidance in labor costs, number and weight of nails required for a given amount of work, etc., but as space is limited I will not include them here. The same also applies to millwork, joinery or finishing, and roofing. In measuring roofs off the plan, care should be taken in getting the lengths of hip and valley rafters. A good method is shown in the sketch herewith, viz., to get the length of valley rafter (A.B.) draw the line (A.C.) perpendicular to (A.B.) and equal in length to the altitude of the gable. Then draw line (C.B.), which will be the true length of the valley rafter, A.B.

A Mill-Wrighting Problem Solved

(Awarded Special Mention, Canadian Woodworker Essay Competition No. 2)

By J. W. Bailey, Berlin, Ont.

FROM the fact that there is insufficient millwrighting about the average furniture factory to warrant the services of a practical man, it frequently happens that the man assigned to the task of setting up, lining, levelling and belting a new machine finds himself confronted with a proposi-

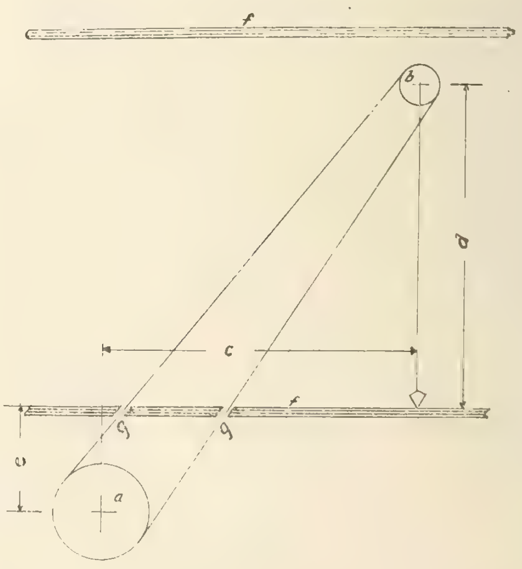


Fig. 1

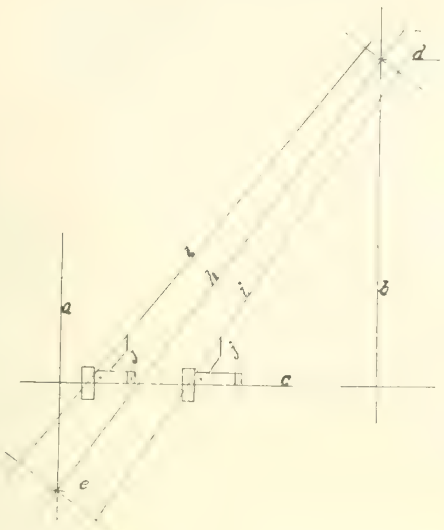


Fig. 2

tion, the practical solution of which requires a knowledge of mechanics along lines with which he is not familiar. This most often happens in plants where the line shafting is below the floor on which the machine is to be set, and during the process of cutting belt holes, timbers and joists, are often cut and the floor otherwise mutilated beyond necessity.

When a proposition of this kind is on hand the proper procedure is to put a line on the floor on which the machine is to be set up, representing the line shaft below. This can be accomplished easily by plumbing from the shafting up to the floor a sufficient distance each way from the location of the machine in order to cover the requirements; then boring small holes up through the floor with a gimlet bit, a chalk line may be made between these holes. This gives the exact line and location of the line shaft as at (a), Fig. 2, and is the basis of our future calculations.

We will presume that the machine is to be driven from a countershaft hung on the ceiling above, and that (a) Fig. 1, represents the pulley on the line shaft below, and (b) the pulley on the countershaft above. The lining of the countershaft can be accomplished by plumbing down to the floor at both ends, and the distances from the line shaft to the plumb bob made to coincide as at (c) (the balance of Fig. 1 being self-explanatory, (f) (f) being the floors, and (g) (g) the belt holes.

To find the exact location of these belt holes proceed as in Fig. 2, (a) being a line representing the line shaft, (b) a line directly below and representing the countershaft, (c) a line at right angles to (a) and (b) and directly below the centre of the pulley on the countershaft. Then on line (a) mark off a distance from line (c), equal to the distance the line shaft is below the floor as at (e). Then on line (b) mark off a distance equal to the distance of the countershaft above the floor as at (d). Through these two points draw a line (h). Then at points (a) and (d) draw lines at right angles to (h) and on these lines, each side of line (h), mark off distances equal to the radius of the different pulleys. Through these points draw lines (i) (i) which represent the belt; then at the points where lines (i) (i) intersect line (c) we have the centre of the belt holes and the angles at which they are to be cut is shown at (j) (j). After laying out the desired size of hole and cutting at the proper angle the chief difficulty has been overcome without undue mutilation of the floor.

The next operation is to line and level the machine. To do this we must take into consideration its belting and determine its exact location by plumbing down from the centre of the face of its driven pulley to the floor. The distance from line (c) must coincide with the distance of the driving pulley from the driven pulley on the countershaft. We must also plumb down to the floor from the centre at each end of the driven part on the machine and have the distances to the line representing the line shaft made equal. Next try the machine for level and if shims are required put them at the corners under the belt holes. When properly level, both crosswise and lengthwise, test the previous points of lining and bolt down. After all the bolts have been firmly tightened the space between the base of the machine and the floor should be filled with soft wood wedges, driven in tight and trimmed off even with the edge of the frame. This gives the machine a full bearing on its base and absorbs the vibration.

The next in order is the belting. Take all measurements taut with a tape (a steel tape is preferable), and when cutting the belting deduct one-eighth of an inch to each foot for stretch and where possible make all belts endless.

The job is now complete. In addition to the saving of time effected by employing the laws of mechanics, there is the satisfaction of having the job properly done.

Practical Stair Work

(Awarded Special Mention, Canadian Woodworker Essay Competition No. 2)

By Robert J Truax, Chatham, Ont.

HAVING obtained the rises or height and the run or length of the stair, our first work is to find the number of risers required to make access to landing easy. In many cases this is figured out by the architect. Between seven and eight inches makes a good rise. A seven-inch rise is easier to travel on than an eight-inch. Take a rod, full length of rise of stairs, and space off in an equal number of spaces. For example, 10 feet will space off 15 spaces of eight inches, which would be the rise of each step. Having the rise we require, the run or length of step is found in the same way, but one space less than in rise. There is always one less tread than riser, the landing forming the top step. Having obtained the rise and run of each step make a pitch board, using, for example, 8-in. rise and 9-in. run. Take a thin, dry board, making square-cut first, then trimming long side to exact sizes. In laying off stringer as in Fig. 1, working from top edge, the writer leaves about 3 in. on top edge, placing a straight edge at this distance from the edge. The writer lays off with pitch board, marking face of riser and step, using a knife in so doing, leaving a good line to work to when housing stringer. Here is where a good joint is required.

Having had strings laid out with pitch board I use a templet with nosing on one end and the other tapered to allow for key, as seen in Fig. 1; also a tapered templet for riser, being sure to have both templets tapered similarly so that the same keys will do for either treads or risers. I make keys about ⅝ in. taper to 10 in., always allowing 1½ in. for nosing in ordinary stairs, giving plenty of room for a cove under tread, as in Fig. 1. Be sure both strings are equal in length. It is best to space off stringer to long side of pitch board, before laying out with pitch board. Having strings laid out, by use of boring machine, bore out housing ½-in. deep, then cut edges of housing down with chisel, and clean out with router to an even depth. If an electric router is used it makes a considerable difference in work of this kind.

Nowadays most stairs have more newel posts than was the case in former years. Newels are made in various ways. The writer prefers the mitred corner as illustrated in Fig. 2. This can be easily made on the shaper and with a little care can be glued and clamped up square, making a good post. They are strengthened by putting glue blocks inside, as illustrated in Fig. 2. Newels are often set on a bull-nose step, the riser being made by taking a ⅞ in. riser and cutting it away to ⅛ in. or thinner, where it comes in touch with the core, leaving a short piece full thickness at one end, and allowing room for two keys. Having riser and core prepared, by gluing and clamping up, using keys to draw the veneer part tight, we have obtained a good riser as illustrated in Fig. 3. We also have many different twists, turns, ramps, and easings in stair rails. A good shaper hand can shape some very awkward work, if performed in the right way. In many cases it is necessary to get stair rail out in short lengths and bolt together, often shaped.

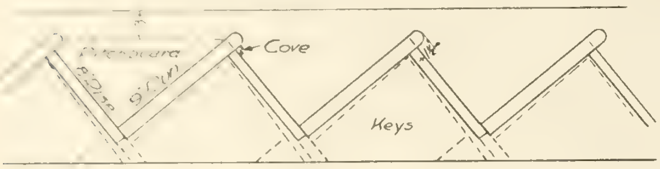


FIG. 1

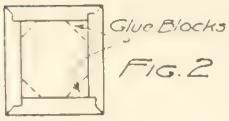


FIG. 2

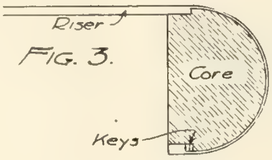


FIG. 3.

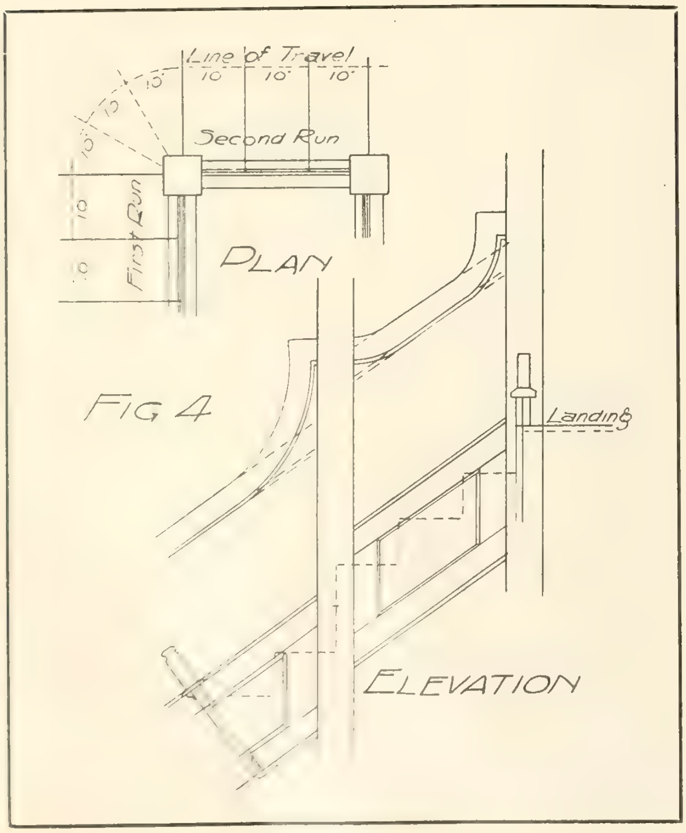


FIG 4

The accompanying sketch, Fig. 4, shows plan and elevation of a quarter platform stair with closed panelled stringer, the hand rail making straight connections to newel posts. In the elevation as shown, intersections of rails to newels can be made with easings, etc., as illustrated, or can be run with straight rails as indicated by dotted lines. Winders could be introduced in same stair as indicated by dotted lines in plan. This would make considerable difference in the newel post. The second run of steps would start two risers higher than in the present sketch, making the post the height of two risers longer.

In the laying out of risers it is best to draw a full-sized plan with intersections to newel post and have the line of travel as near as possible to the run in the other portion of the stair (Fig. 4). This stair could be constructed with a continuous hand rail, doing away with newel post and forming a quarter circle in string; this would mean considerable additional work, consequently it is a method which is seldom employed in stair construction.

The History of the Chair*

By George Cecil

Of late years English furniture men have paid some attention to the possibilities of the chairs in which their ancestors sat, reproducing their grace of form and substantial dimensions—according to the period. France and Germany, too, have followed suit, while the Dutch, Norwegians and Swedes, though lagging some way behind the example set by England, have learned to appreciate the fine models which are stored in old houses. Meanwhile, the examples of antique chairs to be found in America being very similar to those which adorn the homes of English collectors, a condensed history of the chair from early Saxon times may interest readers of The Canadian Woodworker and Furniture Manufacturer.

Evolved from the Stool

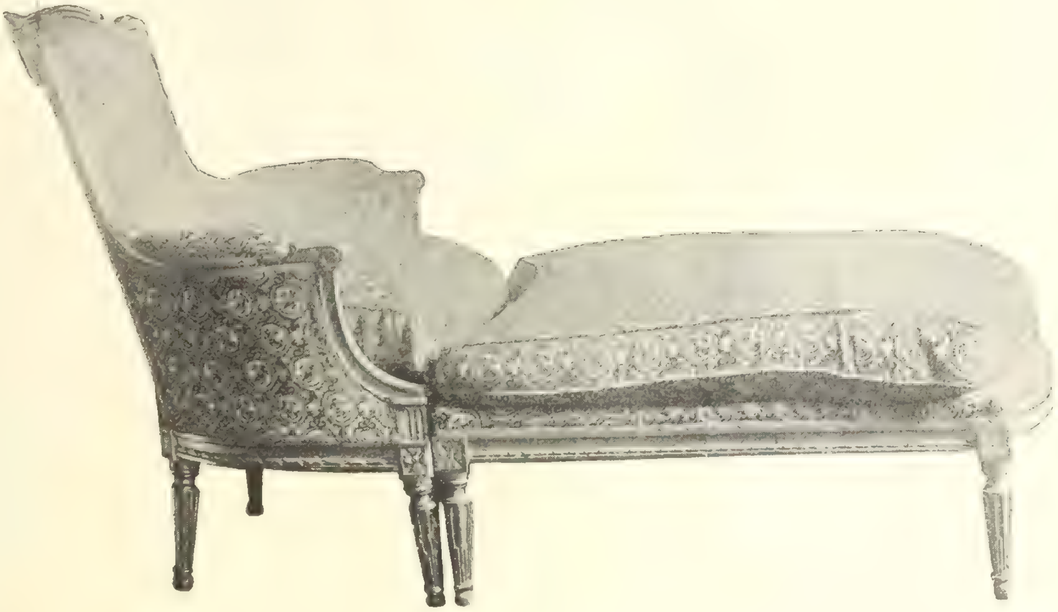
The chair was originally evolved from the stool, which, some five hundred years ago, consisted of little more than a roughly-fashioned slab of wood with three—or four—rudely shaped legs. Later these legs were rendered decorative by means of carving, and, with a view to securing increased stability, joined by a huge cross-star. Then came the huge, high-backed armchairs, which at first were not upholstered, two being placed at the head of the long dinner-table for the master and mistress of the house, the other diners having to content themselves with forms. By degrees the last named disappeared, and, with the relegating of the dependents to the servants' quarters, chairs were provided in the dining-room.

Cushioning Material

Early in the seventeenth century chairs were cushioned, leather, and, subsequently, velvet and silk, being used. Then—with a change from the sturdy (and cumbersome) chair to something light and elegant—came the "caned" variety. The squat Tudor examples in short, gave place to slender, carved chairs, the

---

*By courtesy of the Furniture Worker.

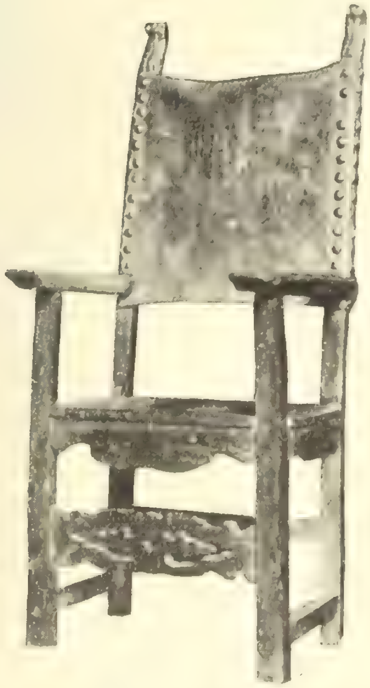


French "chaise longue."

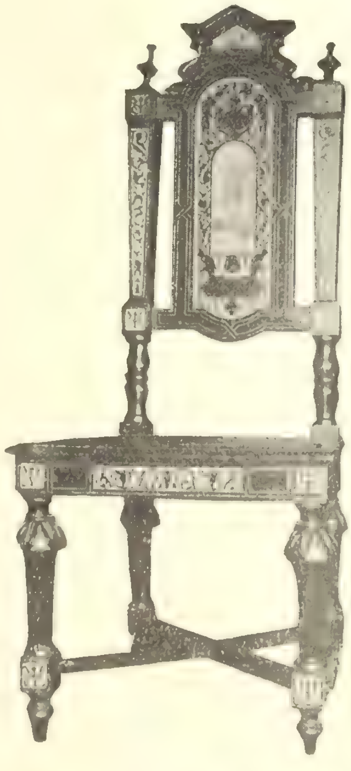
stretchers being rendered highly decorative by means of scroll-work. The arms and legs, too, were scrolled, while the backs were embellished with ingeniously contrived spirals. In early Georgian days the cabriole leg and claw-and-ball foot were introduced, Chippendale perfecting the innovation, the interlaced back and beautifully proportioned arms forming part of his scheme. A little later Hepplewhite lightened the chair considerably, and to this day the Hepplewhite form survives.

A Cushion Chair

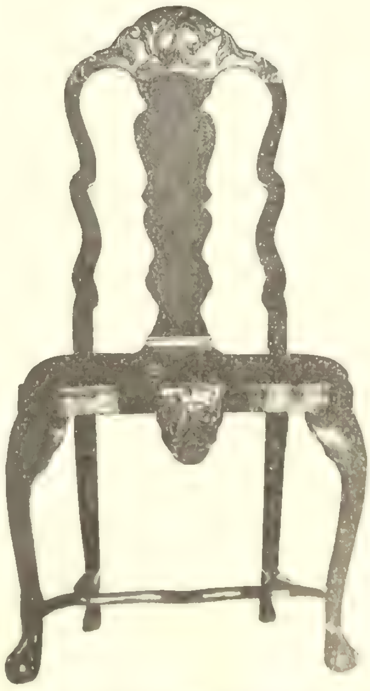
Very curious are the Elizabethan spinning-chairs in solid oak, the arms of which slope down in a straight line from the back, being arranged so that the spin-



Florentine chair, 16th century, leather back.

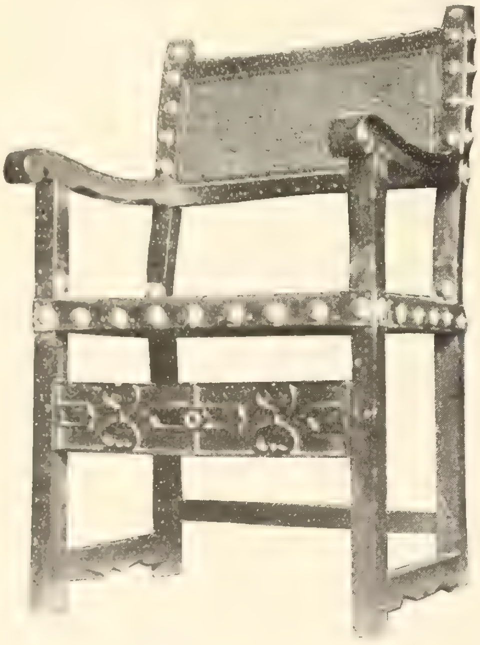


Florentine chair, inlaid with ivory



Queen Anne chair, Dutch marqueterie

Chair of Charles I. period, upholstered in velvet and silk.


Spanish chair, 17th century.

Empire chair.

ner's movements might not be interfered with. Strange, too, are the earliest specimens of all—which may be seen in the Cairo museum. Some are without backs, the legs being finely carved and terminating in bulls' hoofs, while the woodwork is, in some cases, gilded. There are also the Roman chairs in marble, the bronze chairs of the same period, and the ecclesiastical chairs which were made to take to pieces when their owners travelled.

Colonial Chairs

The modern colonial chair differs little from those which are made in England. In some places the famous old Windsor chair (though without the comb-back) serves as a model, while the dining-room chair often suggests Chippendale. India, however, possesses a distinctive easy-chair, which, being carved (for coolness) and sloping at an angle which makes it almost as comfortable as the French "chaise longue," has been in vogue for nearly a century. The chair in question is as devoid of adornment as a deck basket-chair, which it much resembles; but it is the acme of comfort.

Reducing the Cost of Woodworking*

FOREMEN, managers or superintendents, upon taking charge of a strange shop, are confronted with several serious problems, the worst of which is, "What to do, and what not to do."

It is very hard to even imagine a more trying position for a man to be placed in than to be suddenly thrust into the management of a large woodworking plant, with the owners and directors all standing by in expectation of great things from the new manager or superintendent. It is a very hard position to be in, and for the time being it is almost impossible for the new official to determine what his best course should be.

In a case of this kind, perhaps the best thing to be done is to do nothing—that is, make no changes in the personnel or the methods under which the shop is being operated. The inertia of a woodworking shop will keep it moving while the new head is getting his balance, and, unless a previous course of study and well-formed plans have determined the proper course of procedure, the very best thing for the new manager is to do nothing.

In a few days, things will begin to shape themselves, the new head will see things one or two at a time, where the knife is required, and he can apply it gently and steadily until the necessary cuts have been made.

One of the very worst things which a new manager can do is to start in with a whoop and a holler, and give the idea that he intends to turn the factory, if not the world, upside down in about fifteen minutes. The new manager will lose nothing and gain a great deal by taking the gentle course. The workmen are always on edge when a new head is placed over them, and they are either working at high speed or they are in the sulks, expecting a grand turnover, and caring little what happens. The latter condition usually prevails when the new manager "pulls her wide open" the instant his hand touches the throttle. Things become chaotic in the shop, and efficiency and output are alike reduced almost to zero.

But how much different are things when the new manager begins with the "soft pedal!" He lets the foremen run their several departments just as they have been doing and the work moves along as though nothing new had happened. In fact, the work and products are usually above the average, owing to the fact that the men are "keyed up" to their highest pitch, and are doing their best while trying to "size up" the new manager.

---

*By John Scott, in Wood Craft.

Then as the new head becomes acquainted with the peculiarities of his shop, let the work of cost reduction begin. A little change here, a new operation there, the planning of work so that a machine operator can perform the operation instead of its necessarily being done by an expert operator—those are the quiet ways in which the cost of woodworking is to be reduced.

Sometimes the superintendent is obliged to establish an entirely different route for the material as it passes through the shop. The rearrangement of a machine or two, or of several machines, may be necessary to provide a straight line of progress for the material.

Acting along these lines, the manager will find that the secret of low cost production hinges upon a threefold requirement. First, each machine must be kept in operation full capacity all the time. The measure of a shop is the capacity of its machines, and the only way in which the shop can make money is by a percentage of profit upon the material which passes through the shop and the several machines. Hence the necessity for each machine to be in operation every instant of time. Every minute a machine is idle shows a loss from what might be the rightful profit of the business.

The second requirement is the supplying of stock to the several machines, i.e., feeding them, with as little expense as possible. Here comes in the "straight-line" method of progressing material through the shop. Closely connected with this progress of stock is the matter of labor efficiency and useless work which is being done in the shop. This matter may be well illustrated by watching two men pick up blocks and throw them into a truck. One man picks up a couple of blocks with one hand, puts them into the other hand and then throws them into the truck. The other man picks up blocks with both hands and throws them aboard without making an unnecessary motion—all useless labor is eliminated, and that is the problem the superintendent has to wrestle with, to solve if he can, and to tolerate as best he may, bearing in mind that as far as the men deviate from the single-motion method so far will the shop profits fall short of "what they might have been."

The third portion of the superintendent's problem is the condition of the machines. Unless they are constantly maintained at the very top-notch of working efficiency, there must be a corresponding loss in shop profits, for, as before stated, the sole source of shop revenue is in the amount and quality of the work turned out by the several machines. A dull knife here, a slipping feed-belt there, may reduce very appreciably the quality as well as the quantity of the output, and it is up to the cost-reducing manager to keep these machines keyed up to their fullest capacity each and every minute of the day.

The above is one most excellent method of procedure for the new superintendent upon taking charge of a new and strange shop. But occasionally the methods described above fail to work. The older workmen may have gotten so deeply into the ruts of habit and routine that it is impossible to teach them new habits. In this case, the cure is apparent and simple. Just get a new man, and a young one, who can be taught the new and improved methods of doing work.

It is well, when possible, to take charge with the "soft pedal open" as described, and then gradually weed out the poor men and poor machines. This course does not paralyze production as it does when a new superintendent jumps in with his coat off and tears up everything before he knows what the conditions really are. But when it is found that the "soft pedal" method is not bringing results, then a radical change is in order. Things must be ripped up, but a complete turnover then will not stop everything as it would before the new management had become acquainted with conditions and knew how to meet them. Sometimes the rooting out of a few men, perhaps a foreman or two, will be all the change necessary, and make all the difference in the world between slipshod, desultory work and the snap and vim of top-efficiency shop operation. The wise superintendent seeks the cause of high cost of production in his shop, and roots out those causes along the lines of least resistance, be it by the slow "soft pedal' 'method or by a "cleaning out" of the entire shop force and the hiring of new workmen.

German and Austrian Furniture Exports

In the United Kingdom an active campaign is being conducted to secure for British Manufacturers and exporters the trade in foreign and colonial markets which has formerly been in German and Austrian hands. In this campaign the British Board of Trade has prepared memoranda supplying information with regard to possible developments in certain trades resulting from the withdrawal of competitors from Germany and Austria-Hungary in neutral markets. Extracts from these memoranda, which are here reproduced, supply useful information for Canadian furniture manufacturers:—

Exports from Germany, 1912.—Furniture and parts thereof, common—

Not veneered—	
(a) Of soft wood	£101,500
(b) Or hardwood, unfinished	31,150
(c) Of hardwood, finished, and bent-wood furniture	295,850
Veneered (not upholstered)	157,700
Upholstered furniture, upholstered cushions, without coverings	6,100
Billiard tables, covered and parts thereof	5,150
Upholstered furniture, etc., with coverings	88,450
Total of above exports from Germany	£685,900

Exports from Austria-Hungary, 1913.—Furniture and parts thereof—

(a) Of soft wood	£ 30,000
(b) Of hardwood or veneered with common wood—	
(1) Bentwood Furniture	911,200
(2) Other sorts of furniture	81,500
(c) Furniture with or without fittings, or otherwise combined with iron or base metal—	
(1) In the rough	13,300
(2) Stained, dyed, varnished, lacquered, polished	21,100
(d) Furniture upholstered, not covered	15,200
(e) Furniture combined with fine materials except leather or tissue—gilt, silvered, bronzed or finely painted	14,800
(f) Furniture and parts thereof with inlaid work, with coverings of all kinds	8,900
Total of above exports from Austria-Hungary	£1,096,000

Cost Accounting in Woodworking Plants

Outline of a System Which Enables the Manufacturer to Know the Cost of His Product—Factory Routine

By Jonas Howe

A MOST important matter in connection with any manufacturing business is the estimating of the cost of the article produced. Even the all-important sales department occupies a secondary position to that of the cost accounting department. It is of no avail to find customers for the product of a plant unless one is certain that the price for which it is being sold includes, not only the cost of production, but also sufficient to cover all incidentals which may not be considered as entering directly into its cost, and furthermore, a profit sufficient to make it worth while for the company to continue in business. Cost accounting has recently become a very minute science and it is possible to-day to figure out and apportion scientifically all the details of cost which are essential to any manufacturing business. In the woodworking business, cost accounting, while intricate and varied, is of very great importance and can be systematized in such a manner as to give a company complete knowledge, not only of the costs of production, but of the efficiency of machinery, departments and of every individual on the staff.

A woodworking business, like many other lines of production, is a large manufacturing enterprise with several departments more or less connected or related to one another, and is necessarily at the mercy of competitors, employees and the public. At first glance, it would seem a matter of great difficulty, almost an impossibility to inaugurate a reliable system, which will show the profits on the various jobs going through, at the same time showing the profits on the different departments, or indicate whether they are profit-bearing factors or not. In the following articles an effort will be made to describe a cost system which will fulfil these requirements, at the same time being clear and concise in its make-up, serving in short, as a system for showing the cost of production and for reflecting any mismanagement, so that every part of the concern may be made to yield its share of the profit.

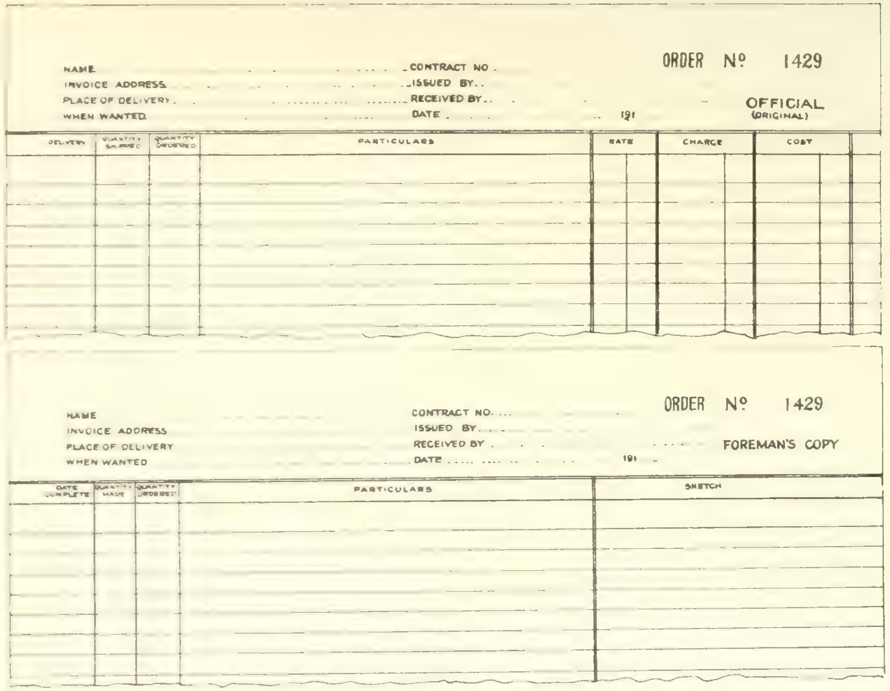
Accuracy is essential with any system for ascertaining the exact amount of time consumed in working on various orders and for learning the correct quantities of raw material which have been used, together with their proper prices and the proportion of expense which is incurred in providing them. These are the most important features to be considered in establishing a reliable system of cost accounting. Many companies have tried to follow these features in a careless or partial manner with the inevitable result of failure and confusion. If one attempted to describe the reasons leading to failure of this nature, he would have to write enough to fill an encyclopedia. Probably the most important feature of a successful system is its simplicity, a feature which must characterize it throughout all its details. Complication of any kind must be avoided at every turn. Beginning with the employees, a limited amount of responsibility should be placed upon each man who has anything whatever to do with the recording of the time occupied or the material consumed in the completion of a job. Each job must have its order-number which is recorded on the time sheets of the men who are working upon it, and also upon the requisitions for the raw material from which it is to be made. The natural and effective method of attending to this is to be careful that a mark or punch showing the order-number is placed upon the time sheet when the job is given out. The responsibility for making this mark or punch may be placed upon the foreman or operator according to conditions which prevail at the plant. It is important to bear in mind the necessity for relieving the operator of all unnecessary clerical work. With this object in view, one should cut out all red-tape, such as requiring the men to write out a number of minute particulars, which in the end are worthless. The "location number" on the time sheet, indicating just where the man worked is amply sufficient for reference, if one desires to learn just what the operator is employed upon or has been doing.

No work should be allowed to proceed in the factory without a written official numbered order, (see Form I.) originals of which should be filed in the general office and first copies in the office of the factory foreman. Following this method the foreman or clerk should give the number out with each job, that is to say, he should see that the time sheets of the men who are employed upon each job bear the same numbers as the jobs. This can best be done by placing a mark or punch on the operator's daily time sheet when an order-number is given out, the mark or punch being placed opposite the indicated time when the work is commenced, and the number of the order placed immediately below the mark or punch. Supposing the order is No. 1429 and was given out at 8 o'clock in the morning (see time sheet Form II.) When this job has been completed (10.40 a.m. as indicated by the time sheet in Form II.), the time sheet is again punched or marked and the order-number of the next job upon which the operator works is recorded below. Following out this system makes the operator responsible for having the correct order numbers and the correct time marked upon their time sheets.

The time sheets are subsequently received by a clerk who figures the hours and minutes occupied upon a job and posts the result on the "cost cards" (see Form III.). Requisition lists are used when raw material is obtained for an order. These lists are also used by the clerk in ascertaining the various quantities of lumber and other raw materials consumed. The quantities and their rates are also posted on the cost cards.

When orders are completed the cost cards are withdrawn; the labor and raw material amounts are totalled and carried forward; the summary is totalled; the overhead percentage (which will be discussed in a later article) is added and the cost is at once ascertained.

Five mahogany chairs, the backs of which were carved with wave and pagoda ornaments and bells, were sold at Christie's, London, recently, according to the Furniture Record, for 220 guineas. A tall-boy chest 81 ins. high by 48 ins. wide brought 105 guineas.



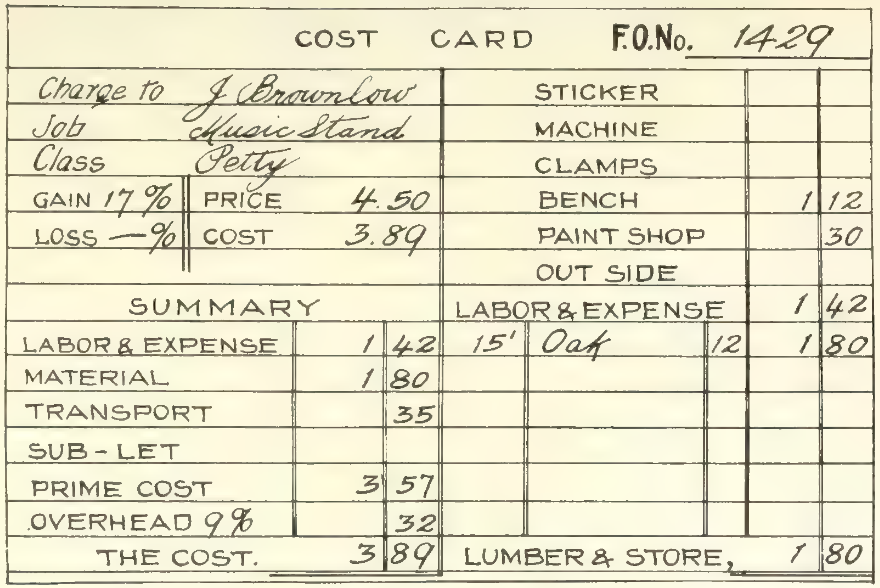
NAME	CONTRACT NO.	ORDER Nº 1429
INVOICE ADDRESS	ISSUED BY	
PLACE OF DELIVERY	RECEIVED BY	OFFICIAL (ORIGINAL)
WHEN WANTED	DATE 191	

DELIVERY	QUANTITY SHIPPED	QUANTITY ORDERED	PARTICULARS	RATE	CHARGE	COST

NAME	CONTRACT NO.	ORDER Nº 1429
INVOICE ADDRESS	ISSUED BY	
PLACE OF DELIVERY	RECEIVED BY	FOREMAN'S COPY
WHEN WANTED	DATE 191	

DATE COMPLETE	QUANTITY MADE	QUANTITY ORDERED	PARTICULARS	SKETCH

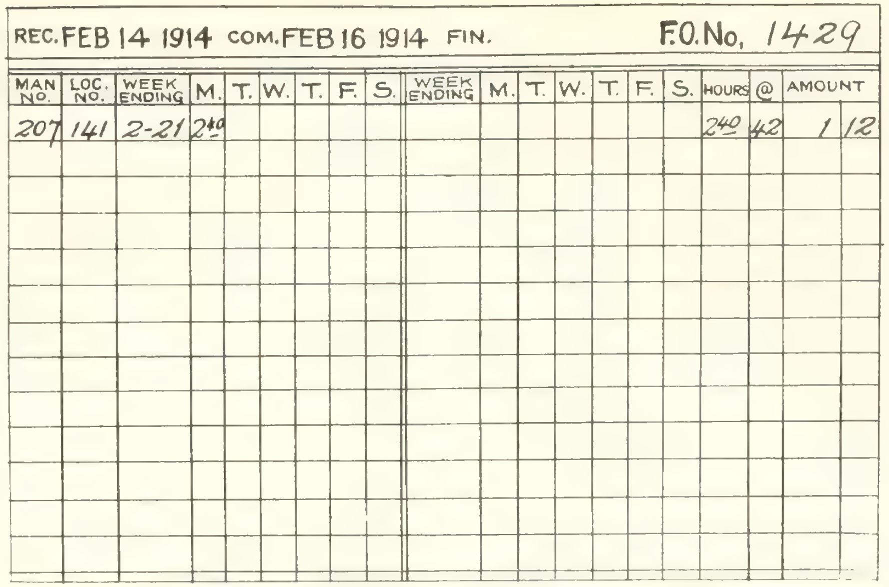
Form 1.—Original order form and foreman's copy.



COST CARD F.O.No. 1429

Charge to J. Brownlow			STICKER		
Job Music Stand			MACHINE		
Class Petty			CLAMPS		
GAIN 17 %	PRICE 4.50		BENCH	1	12
LOSS — %	COST 3.89		PAINT SHOP		30
			OUT SIDE		
SUMMARY			LABOR & EXPENSE	1	42
LABOR & EXPENSE	1	42	15' Oak 12	1	80
MATERIAL	1	80			
TRANSPORT		35			
SUB-LET					
PRIME COST	3	57			
OVERHEAD 9%		32			
THE COST.	3	89	LUMBER & STORE,	1	80

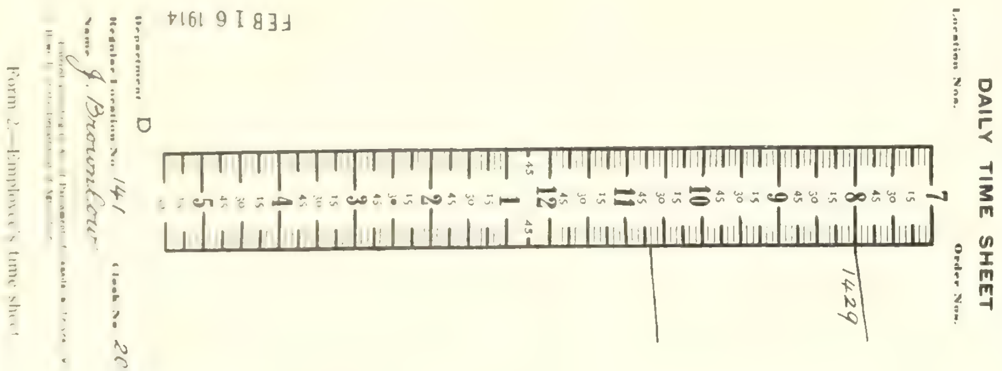
Form 3.—Front of cost card.



REC. FEB 14 1914 COM. FEB 16 1914 FIN. F.O.No. 1429

MAN NO.	LOC. NO.	WEEK ENDING	M.	T.	W.	T.	F.	S.	WEEK ENDING	M.	T.	W.	T.	F.	S.	HOURS	@	AMOUNT	
207	141	2-21	240													240	42	1	12

Form 4. Back of cost card.



DAILY TIME SHEET

Location Nos. Order Nos.

7
15
30
45
8
9
10
11
12
1
2
3
4
5
1429

FEB 16 1914

Department D

Regular Location No. 141 Clock No. 207

Name J. Brownlow

Form 2.—Employee's time sheet

QUESTION BOX

A Practical Department of Reference for the Practical Man

Smooth Finish on Moldings

Q.—"Can you tell us if there is a machine made which will produce a fine smooth finish on moldings, which will not necessitate any hand work preparatory to finishing in the natural wood?"

A.—The best way to secure a finish of this kind is to use a sticker which is capable of producing a perfect surface which will be better than any sanded surface would possibly be. There are machines which will do this on sale by several well-known manufacturers. They must be very heavy with extra liberal bearing surface and the pressure bars and chip breakers must be properly proportioned and easily and effectively adjusted. Such machines are usually designed to operate at rather high rates of feed, and consequently special attention is paid to the strength, disposition and control of the feeding rolls and its driving mechanism. If you already have your stickers and do not care to buy new ones at the present time, provided you cannot get the finish you desire, you will probably have to purchase a sanding machine, which would have to be set up directly behind the present sticker so as not to require a man to feed it. The best machine for this purpose is one which has two large heads composed of corn brooms arranged radially in a circle about thirty inches in diameter, with provision on the forward side of each broom for fastening a piece of sandpaper which, when the heads are revolved rapidly, bears on the work and is made to conform to the outline of the molding by the pressure of the brooms behind. These heads are usually separated, one at each end of the machine with a suitable table and feeding rolls between. One wheel may be set up with coarse and the other with fine paper, and a smooth sanded surface is assured. The sandpaper on the wheels will soon get whipped to ribbons but so long as the paper remains sharp this is an advantage as the head will then conform better to the outline of the molding.

Plugging Knot-Holes in Lumber

Q.—"The writer has seen somewhere an account of a machine which has been built for the purpose of plugging holes and defects in lumber, especially box shooks, but cannot locate it again. We have use for such a machine at the present time. Perhaps you can tell us where to look for information regarding it."

A.—We are not familiar with the machine of which you speak, but this need not deter you from plugging up the knot-holes in your lumber. All that is required is an ordinary wood-boring machine, fitted with a special type of boring tool used by cabinet-makers to obtain a perfectly smooth hole. This, we believe, goes by the name of Fosner Bit. Procure one of these bits about one and one-quarter inches in diameter, cut off the shank so as to make it as short as possible, and use it in a regular chuck, running the spindle at about fifteen hundred turns per minute. Set the table so that you will bore about one-quarter inch deep, and drive into the hole a thin plug cut from the end of a dowel rod of the same material as the piece you are plugging, having previously applied a little glue to the hole. The dowels can either be turned in a lathe or a regular dowel machine and cut up into thin slices ready to be used in plugging holes. If you want to go right through, you will have to simply cut the plug thicker, but for box shooks it is not generally necessary to go clear through. Passing through a planer or over a sand wheel or drum removes the surplus stock of the plug and mkes a very neat patch which is not readily detected if the woods are the same. Systematic plugging saves a lot of lumber and is well worth a little trouble.

Drying Varnished Work

"We have a great deal of varnished work to dry, and should like to know whether any of the drying kilns used for drying wood would be of use for this purpose?"

Answer.—The ordinary drying kiln as constructed for drying wood would not be of real service for drying varnished work, but by various modifications which no doubt would be readily done by the makers of the kilns, it would dry varnish work very satisfactorily indeed. You might write to our advertisers for fuller particulars.

Economizing in Heating

Q.—"Our heating system is an old one which has been frequently added to and subtracted from until it seems to have lost its efficiency. We are not in a position at just this time to make the extensive changes we feel are required, and are writing to inquire if there is anything we can do to relieve the situation until improvement in business conditions warrants a change. Live steam is admitted to the coils at boiler pressure and the several drips are all brought back to the feed water tank where the water mixes with the supply for the boilers, after which it is pumped through the feed water heater which is heated by exhaust steam from the engine running condensing under about 24 inches vacuum. There is a dry kiln included in this heating system, and several glue pots, and as near as we can judge by rough estimate, the amount of water being returned through the traps is about 200 gallons per hour.

A.—We are not, of course, able to give exact figures as we have not sufficient information concerning your plant to go on, but the following you should do at once on general principles, as it is certain to save you considerable fuel at a small outlay compared with the results obtained.

Fit your supply mains to the heating system with reducing valves, and carry just enough pressure to insure steam in all the coils, but not necessarily in the drain pipe from the- coil to the trap. Also overhaul the traps, to be sure that they are not passing steam with the water. Disconnect the returns from the feed water tank and run them to a small tank with an automatic pump which will discharge directly into the boiler feed line between the feed water heater and the boilers. Cover the drip pipes, the tank, and all exposed piping between the ends of the coils and the boilers, so as to save all the heat possible. The reason for this is simple; with the engine running condensing, the temperature of the exhaust steam at 24 inches vacuum cannot possibly be over 140 deg. F., consequently it would be impossible to raise the feed water over this temperature. Now your drips from the heating system will be between 180 and 200 deg. F., and you will readily see the folly of allowing this good hot water to waste itself by running into the comparatively cold feed water tank where you will surely lose it. Follow this plan and I am sure you will be astonished at the economy you will effect.

Producing Chemicals from Wood Waste

Q.—"Referring to the question of wood waste, about which some very interesting matter has been submitted in the Question Box, I would like to know if you can furnish a description of the process of producing chemicals from waste, oxalic acid being of especial interest?"

A.—A great deal has been written upon this subject, but it is of such a technical nature that it is very little use to quote figures, formulas, etc., for the layman to understand. The following is a brief description of the process of producing oxalic acid. Whether or not there is money in it depends upon the kind of wood, the quantity, and the facilities which you would be able to furnish, so that those desiring to go further into the matter would do well to secure the advice of a reliable chemist and then go slow, for while the proposition looks and is attractive, there are still some unsolved problems.

It is first necessary to prepare the lyes and to this end potash and soda are mixed in the proportions so that after causticizing, the proportion of caustic soda to caustic potash will be as 60 to 40. The mixture is dissolved in eight times the quantity of water and causticized by boiling with slaked lime in an iron boiler. Carbonate of lime is deposited and the lye is drawn off into an iron pan and evaporated to 1.3 to 1.4 specific weight.

The sawdust, which must be fine and as uniform as possible, is sifted to eliminate the large pieces, and mixed thoroughly with the lyes so that the latter is fully taken up. The mass is now spread in thin layers in large flat dishes and agitated by mechanical means while the temperature is raised and maintained at 240 degrees C. The pans must be heated uniformly and means must be provided for regulating the heating source very closely.

Water evaporates first, and the mass turns dark brown and then greenish yellow, and the temperature is held at 240 deg. C. until all signs of the wood have disappeared, after which it is taken from the dishes and placed in a boiler containing warm water which is heated to nearly the boiling point by chemical action. The mixture must be still further heated until 38 Baume is reached, after which it is run into crystallizing vats and most of the oxalate of soda which has been formed by the foregoing process, is precipitated in cooling. The lye is now allowed to drain off leaving the oxalate of soda crystals, which after washing in cold water, are treated with lime milk in a heated vessel until insoluble ovalate of lime and soluble caustic soda are formed, the latter being washed out and saved for further treatments of wood, while the oxalate of lime is placed in a lead lined vat and treated with sulphuric acid (dilute), steam being introduced through a lead pipe to keep the solids in suspension and furnish what heat is required. The products of this process are gypsum and oxalic acid solution, the former being a solid which is sometimes used as a fertilizer for clover, and after further treatment in stucco, while the oxalic acid is concentrated and filtered to the strength, color, etc., required by the market.

Equipment of Old Planers

Q.—"Is it possible to equip old planers with round heads and thin knives, and if so, what are the actual benefits which might be reasonably expected?"

A.—There are so many types of old machines, and their condition of repair is so varying that it is difficult to answer your question intelligently. As a rule, it is safe and feasible to so equip old planers, provided they are especially strong and rugged and have ample bearing surface, with nothing in the way to interfere with the application of the grinding and jointing rigs, which are absolutely necessary to secure any results at all. Given a good strong machine with good bearings and good feeding mechanism, round or thin knife heads will produce more and better lumber and require less care than square heads, and on the whole are a satisfactory investment. The raising of grades is perhaps the most important feature in the case, for with lumber advancing in price all the time, while the prices of the finished products seldom advance in the same proportion, it is necessary for the lumber account to be as small as possible. Consequently if you can buy number three's and sell them as number two's on account of having a smooth and fine finish, notwithstanding the presence of knots, cross grain, etc., you have made a distinct advance in your methods which during the life of the heads will pay you a handsome return on the investment.

How to Lay Out Knives

Q.—"The writer is a sticker hand who is interested to know if there is not some better and quicker way to get the profile of a knife for cutting irregular moldings, etc., than those involving the cumbersome figuring and geometrical problems which we see described in trade papers from time to time. These methods may be all right for some, but I cannot comprehend them, and yet wish to find out how to lay out knives in order that I may improve myself in my trade."

A.—What you want is a pair of proportional dividers, an instrument built for this very purpose. Its use is so simple that there is scarcely any chance for an error, the only disadvantage being that a separate pair of dividers is required for each different diameter of head on which the knives are to be used. The height of the outline is measured at different equidistant points on the baseline, and for each distance measured with one end of the dividers, the other end of the instrument automatically indicates the height of the corresponding point of the cutter. One maker of these tools is Charles Fosby, Rutherford, N.J., U.S.A.

Holding Power of Nails

Q.—"Can you give us any information concerning the comparative holding power of cut and wire nails in wood?"

A.—Experiments have been made in which it was found that the cut nail, probably on account of its wedge shape and rough outline, draws 60 per cent. harder than the plain wire nail of the same size, which, of course, gives greater strength to articles nailed by them. This advantage, however, is offset by cement coating the wire nail, so that the force required to draw a cement coated wire nail is about the same as is required to draw a cut nail in the same piece of wood. Cement coated nails may be bought from the manufacturers of standard nails at a slight advance in price.

Distinctive Features in the Construction of Craftsman Doors

THE rapidly growing popularity among builders of hardwood doors in modern residence construction, as well as in connection with other buildings where a high-grade interior finish is desired, has been the subject of a good deal of attention recently. It is within the knowledge of most woodworkers that the hardwood door admits of a beautiful finish, and it is in no way surprising that the architect, builder and owner should seriously consider the selection of the doors to be installed in any specific building.

It requires no stretch of the imagination to realize that the artistic effect of an otherwise ideal interior is frequently spoiled by the fact that the doors do not accord with the architectural motif. The most attractive trim in a house can be cheapened and the interior made to look the reverse of attractive by the use of flimsy and poorly made doors. In fact when a person of keen observation enters a dwelling nothing is more quickly noticed, perhaps, than the style of finish and the character of the doors which are used. There is much in the saying that "doors make the house," for it is generally recognized that when the doors are substantially made, showing evidence of high-grade cabinet work, and are adapted to the general style of their environment they impart character to the building and create an impression of harmony and good taste.

The problem of the manufacturer of a hardwood door which shall be light, strong, durable, weather and wear-proof, and at the same time possessed of the beauties of the hardwood grain, would appear to have been solved. One of the distinctive features of these doors is that every piece of wood going into them is made absolutely dry. Having once been dried the wood is kept to a high temperature in order that no moisture can enter the pores. After a thorough preparation in this manner the cores of the foundations are built up with narrow strips of pine, with edges of hardwood glued together and then subjected to powerful hydraulic pressure. This operation having been completed the cores are planed to an even thickness; the face or surface veneer is applied and again subjected for many hours to heavy hydraulic pressure. The grain of the core or centre piece is all placed at right angles to the grain of the veneer which increases the strength and prevents swelling or checking.

Hardwood Trim in Modern Residences

In an up-to-date dwelling the advantages of hardwood as an interior finish or trim are being appreciated more and more, and the use of hardwoods for this purpose may be said to be correspondingly on the increase. The beauty of finish, permanency and general richness of effect are such as to more than offset the increased cost as compared with some of the other woods.

Effects that were impossible in the past are now easily obtainable and fine interior trim, both handsome and permanent, is more readily within the reach of the modest home builder to-day than it was to the man of wealth twenty years ago. It is an admitted fact that a house finished in hardwood is much more saleable than one which is not so finished.

In selecting the sock for the panels of the doors naturally the most beautiful woods are utilized. Even in woods noted for their beauty it is only the logs of unusually attractive grain and figure that are utilized for this purpose. These logs are taken for veneer and by cutting very thin are made into a great many faces, the plainer stock being used for less conspicuous purposes.

Under the Iowa Factory Act, an operator of dangerous wood-working machinery, such as a circular ripsaw, does not assume the risk of being injured through failure of his employer to safeguard the machine, as required by such law, unless the danger of remaining at work at the machine is so imminent that a prudent workman would not continue to use it. When an employee, in suing for injuries received while at work at such a machine, relies upon his employer's failure to equip the machine with a guard, the onus is on the employer to show that it was not practicable to install a guard on the particular machine.

The Hardwood Market

WITH present conditions in the hardwood trade somewhat stagnant it is difficult to introduce much that may be regarded as original in a review of the hardwood market in Canada. In the trade generally it is a well-known fact that the situation, both here and in the United States, has been depressed to such a degree that improvement is the factor most ardently to be wished for. For some time prior to the outbreak of the war business in the hardwood trade was decidedly better in Canada than was the case in many parts of the country to the south of us. This apparent anomaly has, of course, passed away in the last few months and it cannot be pretended that the prospects for the immediate future are by any means encouraging. Prominent hardwood men with an eye to the prospect of better conditions are maintaining an attitude of watchful waiting, coupled with active preparation for the good time which is almost certain to develop later. However optimistic we should like to be it would be idle to anticipate a revival of business activity before the conclusion of military operations on the European continent. The extent of this activity will probably depend largely upon the duration of hostilities. However we may view the situation the fact becomes apparent that consumers, with few exceptions, are not in a position at present to negotiate extensive purchases. In this respect many orders for shipments of hardwoods to furniture manufacturers and woodworking plants generally, which were booked a considerable time ago, have been held in abeyance for the sufficient reason that the necessary curtailment in manufacture did not warrant the piling up of extensive stocks. The great factor in the situation is the consumer. With the purchasing power of the consumer curtailed, as at present is the case, it is not difficult to understand that the furniture manufacturer, for example, is oblied to curtail the extent of his manufactures in something like the same ratio. Our inter-relationship is thus established to this extent that conditions which affect one section of the community have a direct bearing on other sections. Without normal consumption normal production cannot be expected to ensue.

The demand for hardwoods at the present time has to do largely with thick birch, for which enquiries have come from time to time recently from Canadian and United States consumers engaged in the manufacture of saddle trees. Apart from this there is little business being done. The silver lining to the cloud is observable in the fact that sound financial conditions are the dominating feature in the present situation. In this respect contrast with somewhat similar business conditions prevailing in this country some years ago is most marked. On the former occasion financial depression resulted in the reduction of prices allround, whereas to-day no such reductions have taken place. On the contrary prices are remaining as they are, which goes to prove the financial stability of leading men in the hardwood trade. Across the border extensive business is not expected before the early spring, on account of the approach of the holiday season, to be followed by the taking of inventories both at the mills and at the factories of consumers. Reports of a noted expansion in buying on the part of furniture, vehicle, box and other manufacturers during the last couple of weeks have come to hand from the United States. Quartered and plain oak and high-grade walnut are said to be selling well.

Southern Hardwood and Veneer Market

Written for the Canadian Woodworker

Louisville, Ky., Dec. 10.—The farmer holds the key to the situation at present, according to many astute members of the hardwood lumber trade. In view of the fact that the agriculturist is the one member of the community who has been getting real money for his products, it would seem that he should be spending at least a part of it; but, strange to say, many of those dependent chiefly on the farm trade, such as vehicle and implement manufacturers, have been getting less than the usual amount of business from that source. the farmer evidently having acquired a bad attack of ingrowing conservatism, and having decided to bury his money in the toe of his longest and thickest sock.

One of the things that every business man should do is to create local sentiment of such a character as will encourage the farmer to part with his money. In spite of the fact that he gets cash for everything he sells, and pays cash for nothing he buys, the average son of the soil is so conservative that it takes a charge of dynamite, in many instances, to move him. Like the famous ground-hog of the States, he is very likely to crawl into his hole and pull it in after him if he is slightly mystified or uncertain regarding conditions. Although he is producing an absolute necessity, and seldom lacks a market for his products—and at war prices has a gold-mine in his farm—the countryman is the first to quit buying, and the last to begin again.

If some of the many millions that are being poured out to the farmer were to be promptly restored to circulation through the purchase of implements, furniture and other goods, and the erection of houses, barns and wood-consuming structures generally, business would pick up, members of the woodworking trades would benefit directly and indirectly, and in a few months everything would take on a much brighter hue. It will take a good deal of work to get the farmer started; but if in every community the true situation is pointed out to him, namely, that he has everything to gain and nothing to lose by current developments, he may become sufficiently optimistic to buy.

Another thing is that the farmer who gets scared on general principles about something that concerns him personally very remotely, as far as dollars and cents are concerned, is very likely to hold tight to his money and refuse to pay his bills. He ought to be encouraged by as severe measures as may become necessary, to let go at least enough money to take care of his accounts with his local dealers. If the latter can turn their book occounts into cash, they in turn will be able to meet their obligations with the manufacturers and wholesalers, and the money situation all around will be made much easier. Of course, there are other consumers besides the farmer, and retailers have other accounts than those with agriculturists; but the thing to remember is that the farmer has been taking in money, and is producing right along, while many industrial workers are out of employment, and getting money from them is a difficult if not an impossible task at present. The farmer is the key to the situation, and if he will rise to the occasion he can do much to relieve matters.

The manufacturer is another man who has adopted an illogical attitude in regard to buying. He insists that it will not do to buy until after his inventory period is over. Of course, if his operations do not justify him in adding to his stock of material, there is nothing to be said; but the concern which runs on half rations just because it wants to reach inventory-time with a light burden in the way of lumber on the yard is merely fooling itself. If it were to purchase normally at this time, as at others, and to do this every year, the books would take care of themselves. But forcing down the purchases to the minimum notch every year means that this has to be repeated constantly, and makes for uncomfortable conditions all around.

Predictions made in these columns last month regarding the prospect of rising prices on hardwoods seem likely to come true. In fact, many hardwood men who had been selling lumber right along at current quotations, which in many instances were less than the cost of replacing the stock would have been, are now refusing orders of that kind, having come to the conclusion that buying prospects are better, and that early in 1915 consumption will be sufficient to stimulate the market materially. One of their reasons is that the operation of the new federal reserve act in the United States, releasing from active circulation $250,000,000 of reserves which the banks have heretofore been compelled to hold in their vaults, will make it possible to finance construction work, and thus building operations will be more nearly normal. Another is that the railroads have begun to buy again. Those in central territory have got a 5 per cent increase in rates, and the prospects are that some advances will be granted to Southern and Eastern carriers, and this will enable the transportation companies to stock up again.

The furniture trade is buying more actively, and prospects for the shows are improved, so that hardwood trade from this source is likely to be good. All of these things point to increased use of hardwoods in 1915, and in view of the small stocks of dry lumber, the small number of mills in active operation and the impossibility of replacing, for some time to come, any lumber that is used at present, it certainly seems as if the manufacturer who buys now, at prices which are very favorable to the user, can hardly go wrong.

"One must admire the pluck of the English," observes the Southern Furniture Journal. "While engaged in war, the furniture manufacturers are steadily at work and in conjunction with the retailers are using extraordinary means to boost the consumption of their products. It is this indomitable spirit that has made Great Britain a great nation."

Manufacturing Methods and Equipment of a Large Freight and Passenger Car Plant

The Turcot Plant of the Canadian Car and Foundry Company, Limited

(Staff Article)

NOTWITHSTANDING the tendency towards the increased use of steel in freight and passenger car construction, a large amount of lumber is still used and manufacturers engaged in this branch of industry are among the most important buyers of lumber. They purchase immense quantities of both soft and hard woods, all parts of the world contributing to the stocks which are employed in the exterior and interior construction of the cars. This involves the setting up of large woodworking plants and the storing of immense quantities of lumber. Among the most extensive plants in Canada are those of the Canadian Car and Foundry Company, Limited, with head offices at Montreal, and works in various parts of the country.

Lumber Yard at the Turcot plant, showing telfer arrangement.

The company is a combination of these various plants. It was incorporated in 1909, with the object of taking over three of the largest car manufacturing concerns in the country—the Canada Car Company, Limited, the Dominion Car and Foundry Company, Limited, and Rhodes, Curry and Company, Limited. Since that date these plants have been enlarged and improved and other properties acquired by purchase and construction. There are now eight manufacturing plants, in which are produced passenger and freight cars of all types or the various parts entering into their construction. Four of these plants are owned by the company and four through ownership of their entire capital stock. The entire properties are—Turcot Car Works, Montreal; Dominion Car Works, Montreal; Amherst Car Works and Malleable Foundry, Amherst, N.S.; Fort William Car Works, Ont.; Rhodes, Curry and Company, Limited, Amherst (car plant and warehouses), Sydney, N.S. (factory and warehouse), Halifax, and New Glasgow (warehouses); Pratt and Letchworth Company, Brantford, Ont.; Canadian Steel Foundries, Limited, Welland Ont., and Montreal. The total output in 1913 was valued at $27,000,000.

The officers and directors are Messrs. James Redman, Chairman of Board; Nathaniel Curry, president; W. W. Butler, vice-president; V. G. Curry, vice-president; M. E. Duncan, vice-president; T. J. Drummond, Geo. E. Drummond, F. A. Skelton, secretary and treasurer; Hamilton Benn, M.P., England.

One of the company's largest branches is at Turcot, just outside Montreal, where there is an extensive wood working plant. This adjoins the Dominion Car Works, which manufacture a considerable portion of the iron and steel work required for cars. At Turcot the buildings are nearly all of concrete construction, and arranged so as to facilitate the economical building of cars.

The company have excellent shipping facilities for the reception of their lumber, of which an average stock of between seven and eight million feet is kept. The lines of the Grand Trunk and Canadian Pacific both come into the works. In addition to this, the Lachine Canal forms the southern boundary of the plant, the lumber thus reaching the plant by water and rail. That shipped by water is unloaded on the canal bank and conveyed by telfers to the other end of the yard, where it is placed on lorries and sent to the kilns or direct into the planing and matching mill. Some of the cars are unloaded in the yard, and others are run right into the mill. There are three telfers, operated by electricity, one conveying 1-in. and 1½-in. lumber, the second the heavy stuff, and the third is used to store lumber. The latter is piled directly underneath the telfer, to facilitate moving when required. Adjoining the yard is a large storage shed, and the wood kept there is unloaded direct from railway cars, a track running from end to end. There are two kilns, one on each side

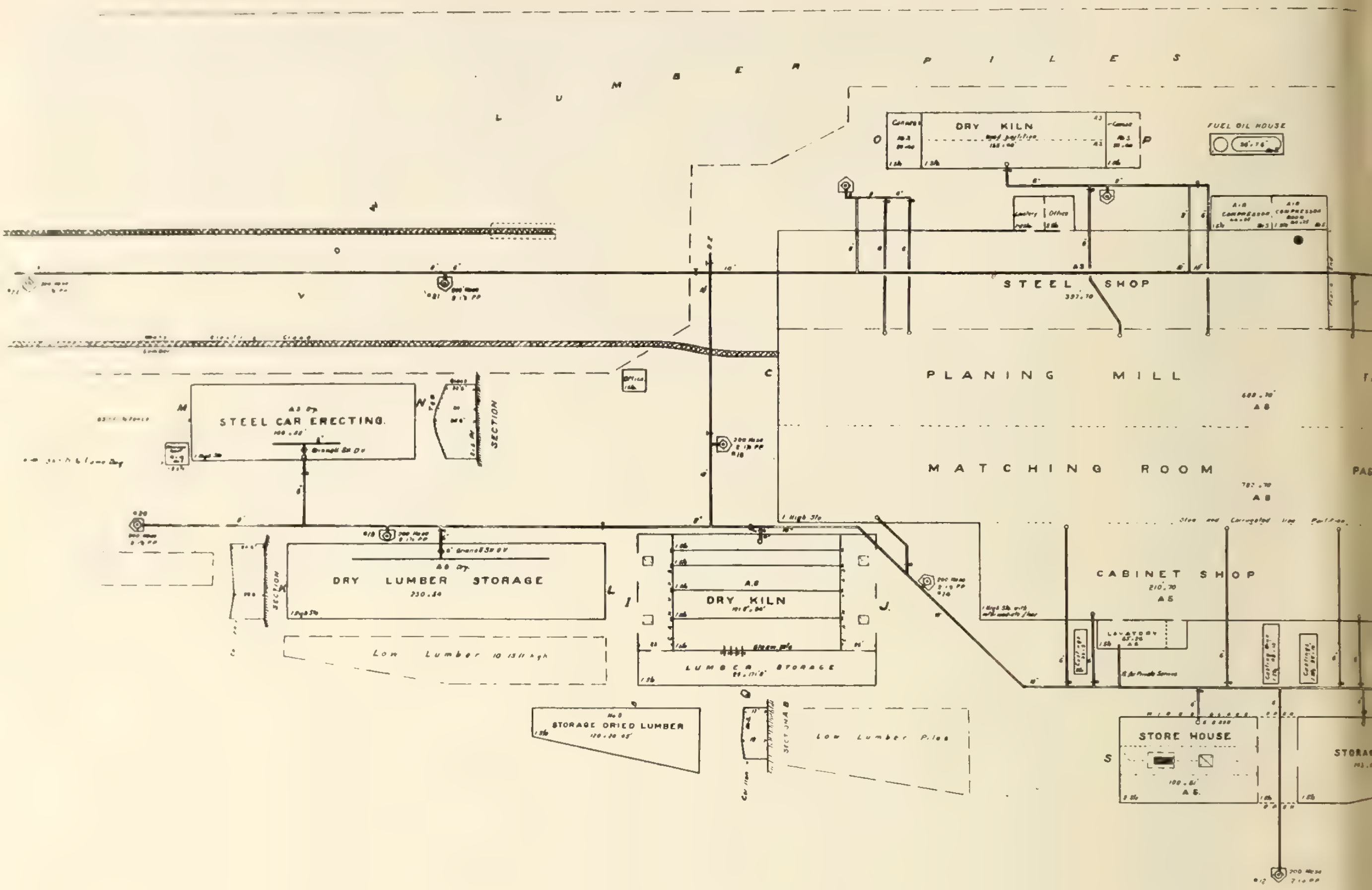
Lower floor of Cabinet Shop at the Turcot plant.

of the plant. The larger one, near the planing and matching mill, has 12 tracks. The lumber, after being unloaded, is placed on transfer trucks, and these are run into the kilns, and after the wood is dried are taken out on the other side.

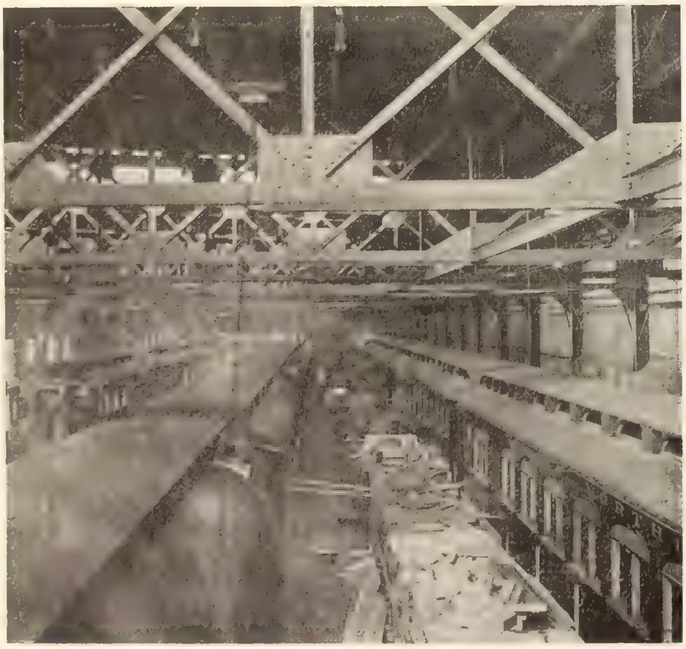
The planing and matching mill is divided, for working purposes, into two sections—one where the heavy work is done and the other where the light work is carried out. There are two 7½-ton overhead cranes in each section—3 of Nile manufacture and the fourth of the Cleveland type. These enable the rough and manufactured lumber to be easily handled for mill purposes and also to be sent to the erecting shop, which is in a direct line with the mill. The planing and matching mill is equipped with numerous machines for turning out parts used in the exterior work, such as sills, posts, braces, etc. The machines include sizers, cut-off saws, sill tenoners, 3 and 5 spindle borers, double cut-off saws, tenoner and coper, 4 spindle horizontal borers, bent rip saws, horizontal car mortiser gainers, single headed tenoner, mortisers, self-feed rip saws, matchers, 5-in. band rip saw, planer, 3-in. band saw, four butting saws, buzz planer, shaper, combination saw, and swing saws. These are by the following makers: Berlin Machine Works, Limited, Hamilton, Ont.; J. A. Fay and Egan Company, Cincinnati, Ohio; Greenlee Bros. and Company, Chicago; S. A. Woods Machine Company, Boston; American Wood Manufacturing Company, Norwich, Conn.; Bentel and Margedant Company, Hamilton, Ohio; McGregor, Gourlay & Company, Galt, Ont.; and Canada Machinery Corporation, Galt, Ont.

About two years ago the company built what is

Upper floor of Cabinet Shop, Turcot plant.

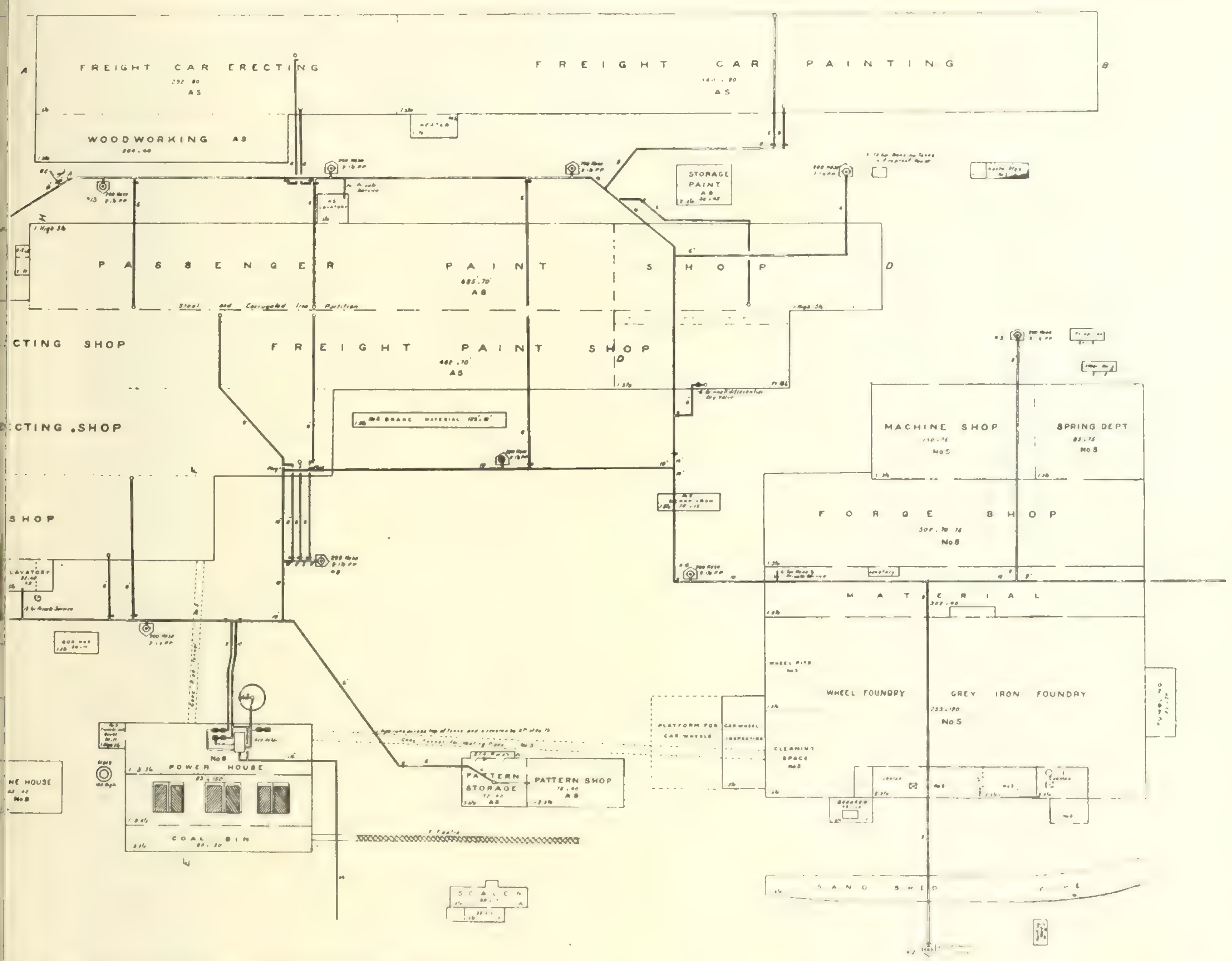


General layout of the Turcot plant of the Canadian Car and F



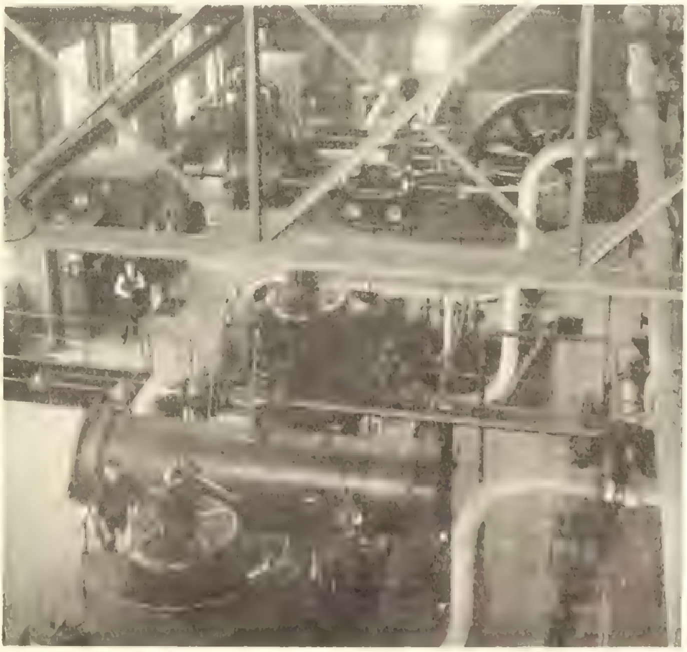
Passenger Car Finishing Shop at the Turcot plant.

Freight Car



ny, Limited, showing the location of the various departments.

, Turcot plant.



Bird's eye view of floor of engine room, Turcot power house showing turbine compressor, etc.

known as the new mill for the building of box cars. This contains wood working machinery for the manufacture of siding, lining, flooring, and roofing, for the purpose of that branch, the remainder of the lumber required being prepared in the other mill. The machines include cut-off saws, double cut and double end tenoner, single end tenoner, and a swing saw. The lumber for this part of the plant is dried in a kiln adjoining and is brought in on lorries run on tracks. When working at full capacity the new mill can turn out about 40 box cars a day.

After the heavy lumber has been prepared in the old planing mill it is, as previously stated, sent to the erecting shop, where the steel frames for cars are put together on the trucks—made in the Dominion plant—and the wooden sills, posts, braces, sides, roof and interior lining fitted. Box cars are dealt with in a similar way, and are in fact completed with the exception of the painting, which is later done in the painting shop by means of spraying. Passenger cars when thus partially constructed are sent to the finishing shop, where the interior woodwork and upholstery work is done—the cars leaving the shop in a completed condition.

The interior woodwork is manufactured in the cabinet shop, consisting of a ground floor and one storey. As may be supposed, the finest work, from the woodworking point of view, is done in this department. All the lumber used is kiln dried, and is brought from the kilns into the shop on small lorries, running on tracks. The machines used are cut-off saws, buzz planers, pony planers, stickers, band saws, rip saws, chain mortiser, chisel mortiser and borer, horizontal mortiser, spindle shapers, surface moulder, combination saws, double-headed tenoner, jig saw, drum sanders (one seven-foot), scraper and toother, spindle borer, belt sander, etc. After being cut and partly prepared, the various parts are sent in an elevator to the floor above, where the final touches are given to the fittings. Much of the work is of 3 and 5-ply. The latter consists of a pine core, cross-banded with ⅛-in. poplar, and faced with ¼-in. mahogany. Of course a large quantity of veneer is used, and most of this is supplied by the Dominion Mahogany & Veneer Company, Limited, Montreal West. There are five presses, in which the ply is pressed after being glued; a heated cull is placed between each piece of 3 and 5-ply, so as to keep the material warm. In order to mould the ply into a bent shape, the ply, after being glued and while still hot, is placed on a wooden form and put under great pressure in the presses. The glue is mixed in a Perfection glue mixer, driven by electricity, and afterwards is kept at a high temperature in a tank. A steam box is used for heating thin pieces of lumber required for window bands. After being well steamed the pieces are placed on forms and bent to the required shape. A large number of hands are employed in sand-papering and in finishing the various parts. Those parts that need staining and varnishing pass to the varnishing room, which adjoins, and on the same floor the upholstering and glazing is done. All templates required for the different shops are made in the cabinet shop.

The following are the principal woods used: yellow, red and white pine, poplar, spruce, B. C. fir, ash, mahogany, birch, oak, chestnut and maple, in addition to many fancy woods.

All shavings and dust are collected by means of a blower system. The pipes for collecting these run under the floors, and the material is forced by fans (supplied by the Sterling Blower Company, Hartford, Conn.) into hoppers on the roof, from which it is conveyed to the power house and utilized as fuel. Edgings and other waste, not suitable for fire wood, are ground in a hog machine, supplied by Mitts and Merrill, Saginaw, Mich., and are conveyed to the boilers in the same way as the shavings, etc. In the case of an over-supply of this waste, it can be diverted from the boilers into a storage room, for future use.

The plant is operated by electricity, individual motor drive being used. The company have their own power and lighting plant. There are a 75 kw., 600 v., 277 r.p.m., 3-phase, 60-cycle generator of Canadian Allis-Chalmers make; two Curtis steam turbines of 500 kw. supplied by the Canadian General Electric Company; a 2,000-foot Allis-Chalmers-Bullock compound air compressor; and two pumps. The six boilers of 300 h.p. each were supplied by Babcock and Wilcox, Limited. The switchboard, with 18 panels, is by the Canadian General Electric Company, while Allis-Chalmers-Bullock had the contract for three transformers, used when extra power is required to be taken from the Canadian Light & Power Company. These transformers step down the current from 13,000 v. to 600 v. The lighting for the plant is by means of multiple arc lamps, and for the office by incandescent lamps.

Mr. W. J. Johnston is the superintendent of the Turcot plant.

The Adequate Lighting of Woodworking Plants

It may not be unreasonable to assert that there was never a period in the history of the woodworking trade when so much attention was afforded to the adequate lighting of woodworking plants as the present. It is a well-known axiom that in woodworking establishments with any pretentions to up-to-dateness, careful attention must be given to lighting equipment, not only for the purpose of accurate work, but also from considerations of safety, the machinery in operation in plants of this kind being generally of such a character that the greatest precautions are necessary to protect the workmen. It is exceedingly difficult to guard the machinery so carefully that the employee may not come in contact with moving parts. Hence the necessity for adequate illumination to afford him the opportunity of seeing the dangerous parts.

In properly designed lighting systems for woodworking plants, the eyes of the workmen are protected from glare. The moving parts of machinery which are particularly dangerous are highly illuminated, while the general lighting enables the workmen to move freely among the machines and through the aisles without danger of stumbling over obstacles. With such a system undue fatigue is eliminated and increased efficiency, combined with more careful workmanship, is the result.

In woodworking shops three methods of lighting are applicable: General illumination, localized general and combined general illumination. The general classes of work carried on in woodworking shops comprise bench work, lathe work and work with planers, mortisers, drills, etc., circular saws and band saws. General or localized general illumination should be adopted for lathe work. If general illumination is applied, about one watt per square foot should be used. Both the general and the localized general system of illumination may be used satisfactorily for planers, mortisers, drills, etc. A system of general localized illumination should be used with circular saws.

Ontario Furniture Exhibitions

Attention is directed to the Fourth Annual Furniture Exhibition, which will be held under the auspices of the Furniture Manufacturers of Berlin and Waterloo, in the Exhibition Building, Queen Street South, Berlin, January 11-16. On the same dates the Fourth Annual Exhibition of Furniture by the Stratford manufacturers will also be held. Here all the exhibits will be under one roof, in the new building completed recently for the Stratford Chair Company, Limited. The Toronto Exhibition will be housed this year in the new Gregg Building, 52-54 York Street, Toronto, the dates being January 18 to February 1.

Furniture manufacturers throughout the Province are leaving nothing undone in their endeavors to make this exhibition the most successful on record. Full particulars may be had from the respective Secretaries.

Laying Sliced Quartered-Oak Veneer

By L. M. Wilson

THIS has been a vexatious problem for the consumers of veneer stock to solve, and while I make no claim to having surmounted all of the difficulties which one meets with when using this kind of veneer, yet some of the methods which I have employed very successfully may be of interest and beneficial to those who have had a more limited amount of experience with this kind of veneer.

It is the exchanging of these different experiences and ideas through these columns which are so helpful to us, each issue giving us some valued information on some one subject that is of interest to us, and in treating on this subject I expect some criticism, for some may have had some of the same experiences which I have and failed to obtain the same results, owing to the different conditions which may have existed.

Any one who has had any experience whatever, no matter how limited, knows that there is a greater saving of stock in cutting sliced veneer than there is in the sawed stock, and we also know that a much better finish can be obtained with a great deal less labor on the sliced stock than on that which comes from a veneer saw. The reason of this is that the saw pulls or tears out a certain amount of the fibre; this is the prime reason why the sawed stock is much more difficult to finish.

But when one wishes to use the sliced veneer and use both the tight and loose side as a face (that is, when wishing to match two or more pieces from the same flitch together), it is quite a problem to get the same finish on the piece where we have the loose side for the face. The heart, or tight, side is usually a shade darker than the open side. Then, again, when the sap edges are turned together, to make the figure match, we find the grain on one piece leading from us and on the other toward us, which produces a bad effect. We also find that the flake on the open side is much more susceptible to scale or check than the heart side.

These are the principal detriments to using sliced veneer. Some claim that panels made from sliced veneer warp much more easily than when sawed stock is used, but this warping is not the fault of the veneer, by any means; the fault lies in the veneer not having been properly treated. One of the worst features we have to contend with, when using sliced quartered oak veneer, is the scaling of the flake on the tight side, and quite frequently one will find a good sized hole. In order to strengthen the scales we use glue sizing.

After the panels had been finished on the belt sander they were then sent to the varnish room and given a good coat of cruel shellac. This shellac, when applied before the panel is filled, is one of the best preventives of scaling that I know of, and, in fact, it is the only treatment that I know of that has been used with any degree of success.

Unless there is some different way devised for slicing quartered-oak veneer, and a way that will insure against the checking or scaling of the flake, I have found but one way to lay it without having to resort to some treatment to protect these scales, and that is to get the veneer long enough so that, when cut in two, one can, by turning the same edge of the two pieces together use the same side for the face. But when this is done the figure loses that rolling effect which is so pleasing to the eye.

It is my belief that if a slicer was constructed so that the knife would start in at one end of the stock and travel by screw power to the other, going with the grain, one could then use either side of the face.—Veneers.

When a top or panel or other wood piece is to have a veneered surface supplied, a piece of veneer amply large to cover is glued on. There is an overhang practically all the way round. When both sides of the piece receive veneer, the piece itself is hidden, which is a detriment when it comes to trimming, as the waste, due to blind cutting, is likely to be excessive. A refrigerator factory was confronted with this difficulty. To obviate the trouble, two pins were placed in the guide of the trimming machine, these project between the two veneer sheets and serve to "feel out" the position of the main piece which is itself hidden. This pin method was also found satisfactory with irregularly shaped pieces. In such cases, however, the pin guides are on more than one side of the piece.

A lot of short-length stock and material that goes to waste at the saw mill might be utilized if we would but develop more extensively the practice of making sash and door stock in dimensions. The white pine people have made efforts along this line, but it looks as if there was room for quite a lot more of it.

When you find a workman who is continuously complaining about the machines, tools and material he has to work with, you can generally figure out that the surroundings are really better than the man, for the really good man is not much of a grumbler.

If a man takes a trade paper covering the industry he is engaged in and says that he does not get the worth of his subscription out of it, it is a pretty good sign that he doesn't read it, for there are but few men who can read without profiting.

A saw that will hold its edges well under hard service is worth so much more than one which will not, that there is not much room for comparison in the matter of price and preference.

A good rule to observe in starting up a machine which you have not been operating for some time, is to examine it carefully first to see that it is in good working order.

THE FINISHING ROOM

The Refinishing of Antique Furniture

(Awarded Special Mention, Canadian Woodworker Essay Competition No. 2.)

By Robert Ferguson, Toronto, Ont.

WHEN we speak of old furniture, we mean those antiquated pieces which were the pride of the grandmothers of long ago. As the old homesteads changed owners, and fashions and styles changed also, it was relegated, piece by piece, to that mysterious realm of our youth, in which we delighted to wander, and in our infant imagination peopled with the most mysterious shadows—the attic. Quite a considerable quantity of this old furniture may be seen in the Royal Ontario Museum, Toronto. It is of ash, oak, walnut and some mahogany, massive and well-made. Much of it is well preserved, even that which had been used. Some of it was made on harmonious lines, while the carving of the best pieces is equal to the excellent work of the present day, except that it might, perchance, be thought to be overdone. Very little was varnished at the time it was made, and on what has been so treated the varnish has been applied without much discrimination.

What was finished at the time of construction was done in oil and that which was done well by being well rubbed in, coat after coat, usually made a fine appearance. Oil finish is a slow and tedious method when properly done, but it certainly lasts, which goes to show, all things considered, that we have not improved on some of the methods of our forefathers.

During the last few years it has been the fashion to decorate this old furniture in various ways and accord it the place of honor. Much of the new decoration of it is grotesque, done by inexperienced persons with paint and drapery, without any regard to its setting, but some have taken a sensible view of it, and finished with stain and varnish. When done properly, it has resulted in some beautiful grain and color effects. Age has lent a peculiar fulness of tone to the work, which cannot be produced by artificial means. Varnish brings out the tone in all its richness, unsurpassed by even new work. I shall refer first to that wood which has never been treated to finish of any kind—simply left as it came from the hands of the cabinetmaker.

Of our native woods none colors so rapidly as oak, nor does any which was originally as light become nearly so dark. This is due to the action of tannic acid. Walnut darkens more quickly than cherry; maple darkens less rapidly than any of our light native woods; but age, in the absence of finish, gives it a soft, rich texture which is observable in no other wood. Except as to staining, the finish will apply equally to oak and ash. They are much alike, both in density and form of grain. Old ash requires an oil or water stain, while with old oak, when staining is required, a light wash of acid stain will fulfil all requirements.

The surface of this old furniture is often found to be filled with dirt and grease, so thoroughly embedded in the pores as to be practically a part of the wood. That must be thoroughly removed, which cannot be done merely by washing, but must be soaked for some time in a strong alkali water. Care must be taken that it does not bleach in spots, due to the alkali being allowed to become dry in places previous to washing. If oak is desired to be stained, ammonia may be used, as it will darken the wood, and thus serve a double purpose at one operation. It should not be used, however, for other woods, as it is liable to bleach them instead of staining.

In all cases see that the pores of the wood are entirely free from extraneous matter. However, you may use an acid stain on other wood than oak, by first washing with tannic acid, when ammonia or acid has the same action as on oak. But the writer has never seen as handsome effects as with oil or water stain, particularly the latter. Washing and staining raises the grain of the wood, which may be obviated by drying quickly by artificial heat. Under no circumstances dry it in the sun, as the grain will rise more than in any other way.

Old furniture often presents a grey tone that is becoming quite popular. It may often be finished without any further staining. If a darker tone is desired, a good way, if it has been washed with ammonia, is to give it a further washing with bichromate of potash. Do not use the potash too strong. Merely fill a bottle about one-fifth part full of pulverized potash, and fill up with water, allowing it to stand until thoroughly dissolved, which requires a couple of days. Repeated solutions will bring the tone desired, but this method of staining applies only to oak. Ash takes on a brownish hue with age; it never becomes as dark as oak and besides it takes oil or water stain. In an early day it was much used for furniture, also for house finish and for floors. Maple takes on a kind of greyish brown color, and is very handsome when finished without staining.

The main point in finishing is to get a perfect surface. The filler should be adapted to the porosity of the wood. Some woods, open grained, require a heavier filler than close grained woods. So with a paste filler. It should be thinned to such a consistency that it just fills the pores, leaving as little as possible on the surface. When the filler is dry, go over it with fine glass paper, remembering that the firmer the filler is, the easier it will rub down, and the smoother the surface will become. So it is with varnish, which should be allowed plenty of time to harden. Rub the gloss out of each coat with curled hair, Irish moss, or something of the sort, before another is applied. The finest finish is obtained, however, by rubbing each coat down with pumice stone and water.

There are various methods of obtaining a polish finish,—by the use of rubbing oil, petroleum, linseed oil, and rottenstone; but without doubt the finest finish is obtained with sweet oil. It seems to impart a soft lustre not obtainable by other methods.

Every business day should hold its lesson for the man anxious to improve his service and extend his business.

Matching Colors in Finishing[1]

EVERY finisher has more or less matching to do, and sometimes this is one of the most difficult parts of his work. If a finisher is given a piece of furniture and told to match it, the task is a comparatively easy one, but if he receives a sample of wood and is told to finish some furniture to match that, he might well "sweat great drops."

To many it may appear an absurd thing to say, but every finisher knows it is a fact that a sample piece of board may match either or both of two pieces of furniture, and yet the two pieces of furniture may be far from matching. This is not so likely to occur where all three pieces are veneered, because, in all probability, the first piece of furniture will be made of the one kind of veneer and it will be the one shade and depth of color all over, and the law of average does not have to be used to get a match.

But where the original piece is made partly of solid and partly of veneer, or where part is birch and part mahogany veneer, or where part is gum and part Circassian veneer, there is considerable difficulty in finishing a board that would be a positive guide to another finisher in finishing a third piece to match the original one. And this difficulty is intensified by the fact that the third piece is not made of the same kind of veneer as was the piece to be matched.

The finisher who is asked to match a piece of furniture should be given all the data possible to work on. Suppose you have a piece of furniture you want matched by a piece made by some other firm. Suppose it is a mahogany piece with veneered drawer fronts, top and ends, and the rest solid. If you want to send a sample finish it should be made on veneer and match the veneer on the original piece exactly. Sometimes the solid wood is a shade darker or a shade lighter than the veneered parts, and, if so, this fact should be made known to the finisher who is to do the matching. If the solid parts on the original piece are a shade lighter than the veneer, even though the veneer matched exactly, the two pieces, when looked at as a whole, would be far from matching each other. It is not very often that furniture is made with the solid parts the exact depth of color as the veneer, and this knowledge is an important factor in matching.

The buyer for one of the largest furniture stores on the continent recently called at a certain factory and made a considerable purchase, but he did not buy any Circassian, as he said he did not like the shade of finish. "If you will let us know your requirements we will either make it specially for you or adopt it as our standard finish," said the manager.

"I will have our finisher prepare a sample and send it to you," said the buyer.

In due time the sample arrived and it was of a color quite easy to make, but the finish had a sort of milky or cloudy appearance that puzzled the finisher. He took the sample to the manager and asked if he was supposed to produce that milky effect, and was told: "That is your sample; go ahead and reproduce it."

And he did; he reproduced it in every detail. But the first lot of goods shipped to this house brought the kick that the finish was not clear; it was milky. An investigation revealed the fact that the man who finished the sample did not intend to make it milky. He did not have any bleached shellac handy and coated it with a pigment surfacer.

Too much care cannot be taken to have the sample correct in every detail. The finisher who is to do the matching will study it in all its details, and nothing will escape his attention.

Frequently a dealer will write a manufacturer for samples of his different finishes. Some firms will make these samples of any old stuff; get it from the scrap-heap or anywhere. Now, this is all wrong. These samples should be selected and finished with the same care that is exercised in regard to the goods themselves. And, in the case of oak, the necessity for care in the selection of the wood cannot be too strongly urged. Even in the case of veneer one side of a piece may finish quite differently from the other, and the sample should be selected so as to produce the general effect. Mahogany, or any one of the woods that are of fairly uniform texture and are colored with a penetrating stain, are not quite so particular in this respect.

In the case of Circassian, which is finished as near natural as possible, with perhaps a slight deepening of tone, the figure is the all-important thing. Unless the light parts are shaded in to make the color uniform, it is impossible for a small sample to give an idea of the general appearance. To finish this veneer according to the modern idea, it is well to do this shading, as the striking contracts are no longer in favor.

Finishing Curly Birch

REALLY nice curly birch is so scarce that it is usually cut into veneer and used as a face on reinforced work. When properly finished it is difficult to conceive of anything more beautiful than this wood. Its beautiful figure and its changing lights place it on a par with the finest mahogany. Curly birch may be finished in many different shades, all equally beautiful, says a writer in Veneers.

If one wishes to finish it as light and as near the natural color as possible, it should first be coated with bleached shellac, and when this is dry it should be sanded with very fine paper, then coated with a very pale varnish. A pale pigment surfacer may be used in place of the shellac. This surfacer may be made as follows:

Sift 1-lb. of finely-ground and bolted silex into a quart of very pale varnish; then add 1 pt. of turpentine or other suitable reducer and allow it to stand for twenty-four hours. Strain through book muslin before using. The drying qualities of this surfacer may be improved by the addition of brown japan, but the japan should be very pale; and for every quart of the japan add ½-lb. extra of the silex.

Sometimes it is desired to finish the wood a shade darker than the extreme natural color, and this may be done by the use of orange shellac as a surfacer. If this gives a deeper tint than desired, make a combination of orange and bleached shellac in the required proportion. If a still deeper tint is wanted, dissolve one of the yellow Soudan stains in a mixture of turpentine and brown japan, two parts of the former to one part japan. This will give a rich golden birch.

If a natural mahogany shade is wanted, make a water stain from the brown and red shades of mahogany powder, using the powder in the proportion of eight parts brown to one part red. Do not make the stain too dark, as natural mahogany is not a dark wood.

Curly birch is beautiful in either the polish or eggshell gloss finish. For the latter finish a heavy body is not necessary. Two or thre light coats of a quick-drying varnish or lacquer will enable it to be rubbed quite smooth, if the wood has been previously well cleaned up.

---

[1] By Rudolph Kilbourne in Veneers.

Recently we made a large wardrobe for a private residence. The stiles were plain birch and the panels curly birch veneer. The shellac was equal parts orange and bleached, and we used a medium pale varnish rubbed to an egg-shell gloss. It looked rich and beautiful when completed—rich enough to occupy a place in the home of the richest man in the city, which it does.

The Machine Sanding of Various Woods

IT is a far cry back to the days when sanding was done by hand, and it is not the intention to consider that phase, or any of the minor intervening phases, in this article. Here will be considered the use of sanding material used with good results in putting work through the modern single-surfacing or double-surfacing sanding machines. Less than three decades ago, cherry, walnut and mahogany were in extremely popular demand, particularly in desk work and cabinet-making. The ever-growing scarcity of these woods, causing an increase in price, has swung the demand to the substantial oak. Still there is, and probably always will be, more or less of a call for the former woods. Cherry and mahogany are difficult woods to sand on a roll-feed sander. There seems to be something in the nature of these woods that shows out every scratch, dent and feed mark of the sanding machine, so in working this kind of material the operator much be sure that he has his adjustments made to a hair, so to speak. It is not fair to blame poor work to the sandpaper when in realiy the fault is elsewhere.

Too fine a grit is not good for a finishing paper, because cherry and walnut cut very easily on a sanding machine, as also do most grades of mahogany, including the San Domingo, Cuba, African and South American mahoganies, baywood and Spanish cedar. The last two woods are used exclusively in place of mahogany, having much the same grain and figure. On the finishing drum, practical work has proven that No. 00 in a garnet will give the best results. In sanding cherry and walnut, care should be taken to always have the fine paper absolutely sharp. On most grades of mahogany it is possible to use a somewhat dull paper, although the hard San Domingo mahogany needs a sharp paper to sand it perfectly. Garnet paper has been found superior to flint, and the best combination on a three-drum sander is 1½, 1, ½, or 1, ½, 00. On some work garnet paper is used to advantage in the combination of 2, 1, ½, but this is a little coarse for doors or panel work, where the sanding is across the grain on stiles and muntins. In such cases a No. 00 paper should be used for the finish paper.

Now consider some of the woods used for interior decoration. White pine, basswood, poplar, whitewood, elm and butternut cut very easily on the sander. The woods are soft, and, after being kiln-dried, during sanding are apt to become "dusty." This dust will accumulate on the last outfeed roll, especially when a fine paper is used for finishing. Here is where a good brush gets in its work, not only in cleaning the stock after it has gone through the last paper roll, but also in cleaning the bottom feed roll. If the dust is allowed to accumulate, it mashes into the softwoods and spoils the sanding. On these woods 00 garnet is good, or 0 is perhaps a better paper for finishing, particularly on straight-grain work. When sanding hard pine, North Carolina pine, cypress, or some of the other sticky woods, we have material that tests the quality of the sand paper, for the gum in the woods clogs the paper to a great extent. Here it is wise not to use too fine a grade of paper. Maple and birch are hard on sandpaper, but, being close-grained, it is possible to give them a high polish with a comparatively coarse paper.

When sanding such woods as Circassian and burl walnut, crotch mahogany, rosewood, gum or some of the other fine cabinet woods with a very fancy figure and grain, and which is to have a fine polish, then is the time to get in good work with the fine grits of paper. Just a word here. A fine grit is useless on a sand drum out of balance or not cutting absolutely the same from end to end and running true with a light pressure on the pressure roll. Some sanders can be so accurately adjusted and run so true that a good operator has no trouble in producing the finest work on the above-mentioned cabinet woods. The most used of all woods is the ever-substantial, sturdy oak. Quarter-sawn oak is a hard wood to sand on a poor sander, but when put into a modern machine, with its contrivances for helping to make good work, it comes out at the rear end as smooth as velvet and fairly shining in splendor.

The characteristics of oak are somewhat different to most of the cabinet woods. It has a very open grain, and in quarter-sawn oak there is a hard and soft grain, as well as an open grain. The figure, or splash, which gives it character, is hard, and, of course, the remainder is comparatively soft. Too fine a sandpaper with a heavy pressure on the drum will eat into the soft and leave the hard, thus causing a wavy appearance. Sometimes, in any kind of work, the paper on the machines gets clogged up with the dust before it is worn out. Frequently if a piece of hardwood is run through at a sharp angle it will clear the paper for further use.

Another trick comes in handy when the operator is crowded for time with a big pressure of work behind him, and cannot afford the time to change the sandpaper. Perhaps it is the case that the coverings have just been put on, when some one comes along with a gummy piece of work, maybe all covered with glue, and a hard spot or knot in it. The piece is run through to accommodate the workman, with the result that a streak is burned in the paper.

As to the paper itself, it would seem that a book might be written on the different grades of papers that are put out by different manufacturers. One maker of sandpaper has a No. 1 that is almost as fine as a No. ½ of another, and the differences will be observed by the operator. So it is really up to the man that is doing the work to decide what paper is best suited to the requirements of the operations he has in hand. As to the qualities of flint and garnet papers, the latter is coming more and more into popular use, and wherever experimental tests have been made it has, in almost every instance, lasted longer and produced better results.—Wood-Worker.

The use of enamels as furniture finishes continues strong in certain lines, particularly in bed room furniture, but the effort to extend its use to the whole range of house furnishing has not been a success. The chief point against it is from that strongest argument —lack of suitability from the economic standpoint. It soils and mars so easily that it does not give satisfaction in dining room furniture or other situations where hard usage is the rule. Its strongest hold is in the realm of bed room furniture, where it has infinite possibilities in the daintiness and light effect which is desired.

ANGLO
RUBBING and POLISHING

Works free and easy and can be rubbed
in two days.

WRITE FOR SAMPLE

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

THE GLUE BOOK

WHAT IT CONTAINS

Chapter 1—*Historical Notes*
Chapter 2—*Manufacture of Glue*
Chapter 3—*Testing and Grading*
Chapter 4—*Methods in the Glue Room*
Chapter 5—*Glue Room Equipment*
Chapter 6—*Selection of Glue*

WOODWORKER PUBLISHING CO., LIMITED
MacLean Building, Toronto

Varnish Brushes

"Meakins Quality"

We specialize in popular-priced, well-made brushes for the factory trade.

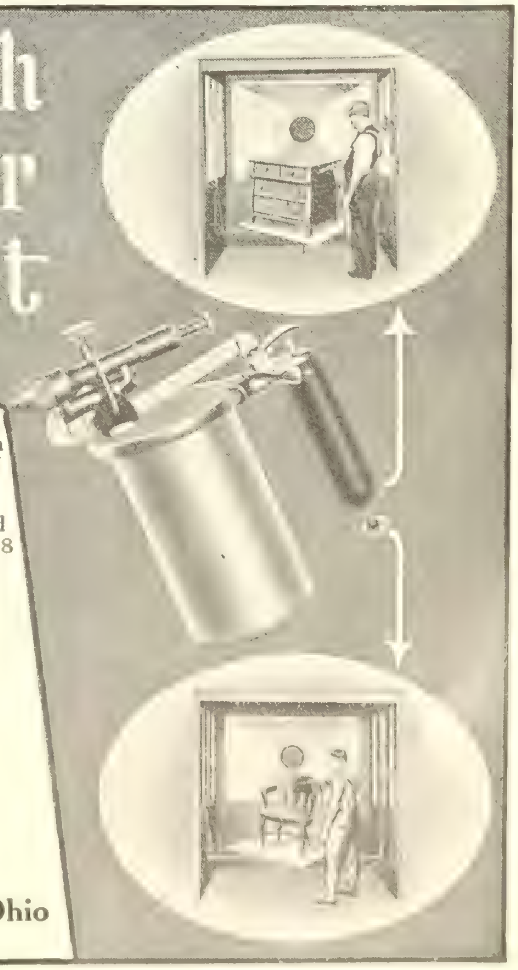
A complete line for furniture and piano manufacturers.

Write for Catalogue.

Meakins & Sons
Hamilton, Ont.

A Better, Finer Finish at a Lower Cost

With the Aeron System
Paints With Air — Guaranteed



which applies first coaters, enamels and varnishes—thereby removing the inefficient, unsatisfactory hand brush from the finishing room, a smooth and uniform surface is always obtained. There are no brush marks, no thin spots, no sags, no runs and no fatty edges. Every article of furniture comes from your factory perfect in finish—a finish that cannot possibly be produced in any other way than with the AERON SYSTEM.

Along with this marked improvement in finish, there is a surprisingly big saving in time and labor. In AERONING, there is no lost motion, one man accomplishing as much as 2 to 8 with a brush—doing better work—effecting a saving of 25 to 90 per cent.

SIMPLE IN OPERATION The AERON will instantly and accurately respond to the operator's every inclination—will meet every requirement. No matter how irregular or rough the surface may be, or how difficult of access the places are, the AERON finishes smoothly and readily. The complete equipment and service is installed on a guaranteed basis.

PROVED RESULTS The AERON SYSTEM is used in hundreds of furniture finishing rooms, and is faithfully and successfully performing its every function. These manufacturers receive daily proof, in the form of savings and better work, of the merit, the economy, the efficiency of the AERON—our claims are based on these actual and regular performances of the machine.

A Post Card request from you will bring
AERON Catalog and AERON Detailed Information BY RETURN MAIL

The DeVilbiss Mfg. Co. 1318 Dorr Street, Toledo, Ohio

Veneers AND Panels

Built-Up Stock Veneer, with Pointers on Laying

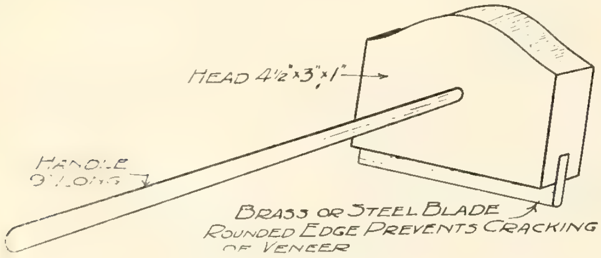
Second Prize Essay, Canadian Woodworker Competition, No. 2.

By Albert Hudson, Hespeler, Ont.

TODAY the use of veneers and built-up stock is greater than in former years. Even today some veneer manufacturers are producing a real veneer wall-paper, backing the veneers with a strong paper after the process has been gone through. The object of this paper is simply to hold the veneer to the wall.

One of the greatest problems of the furniture manufacturer is the making of invisible joints. Veneered joint, correctly matched and glued properly, does away with most of this trouble. In my opinion it is also easier to get a joint when veneers are used, instead of solid material. Open joints are seldom found in veneered stock, and as a rule better matching up is possible.

Some people have the idea that veneered furniture means cheap furniture. This, however, is a mistake. Some of the finest furniture is made from veneered stock. For example, examine a piece of antique furniture, and you will find that the parts calling for durability and beautiful effect have been veneered. Veneered goods are reliable and durable—more so than solid goods. Built-up stock, consisting of several layers of veneer glued together, is being used more frequently in the woodworking business. Furniture tops, tables, panels, drawer-fronts and bottoms, chairs, finish of passenger cars—all these are examples.


HEAD 4½"×3"×1"
HANDLE 9" LONG
BRASS OR STEEL BLADE ROUNDED EDGE PREVENTS CRACKING OF VENEER

Details of veneer hammer.

This stock is lighter than lumber and is less likely to warp or check. It has also the strength required. The cheaper woods can be used for its manufacture, and therefore it is probably less expensive.

Great progress has been made in recent years in the manufacture and laying of veneer. Veneers are cut into a number of thicknesses. The domestic woods, rotary cut, come from five-sixteenths to one-fiftieth of an inch, and the imported from three-sixteenths to one thirty-fourth. The most popular size is the one-sixteenth. The one-twentieth is also used frequently. In the sawed and sliced veneers the thicknesses mostly used are the one-twentieth and the one-thirtieth.

Veneers should be handled carefully as considerable damage can be done and flitch after flitch of veneer ruined by careless handling, with the result that money leaks out of your factory simply because of careless handling and poor storage. The tendency of veneers to absorb moisture while in the bulk emphasises that great care should be used to see that the stock is kept in a uniformly dry place, and, in addition, to see that all veneer stock should be carefully re-dried before it is glued up into the finished product. The matching up of veneers is very important. This requires experience. Herein is one of the beautiful effects of veneering. The dealer can always demand a good price for the article. It should always be remembered that veneer has a right and wrong side just as much as cloth. One frequently finds this point neglected and the wrong side is put on the outside, the result being that when the veneered stock is sanded it is found to be flaky or shelly.

The next point is that it must be glue-sized. But what about the finishing? It always shows up more or less and it cannot be altogether hidden. I have seen sideboard and buffet tops spoiled by being sized because the flaky side was put outside. There are some of our veneer foremen who do not know this important part of their work, or are slack in their methods. Some may say that this is only a small thing. That may be, but we must remember that little things make big things. It is profitable to attend to details even in a furniture factory.

There are problems in connection with the selection of face veneers. Some have to do with the practical application of veneer in using, as already stated; others deal with the appearance of the finished product.

The writer, when apprenticed, spent one year exclusively at veneering by hand large and small stock, after which he was sent into the veneer room for instructions from the veneer foreman along the line of veneering carried out in that department. Many times he has had his work condemned simply because veneer was put on wrong side out.

If your veneering comes out flaky it will pay you to attend to the matter.

In jointing veneers take two boards, and using two hand screws, joint on the veneer jointer. Some factories have trouble with the jointing and taping end wood veneers. One day I was watching a man jointing some crotch mahogany in the above way. The edges were tearing dreadfully. I suggested to him to take half of the veneers and try again. The result was to remedy the tearing. The trouble before had been caused by the attempt to make too many joints at once. Only a few pieces should be placed between the two boards, and satisfactory results will follow.

Often one finds crotch veneer buckled very badly. This must be straightened out before it can be laid successfully. If not straightened out the press will break it in pieces, and when you come to release it from the presses you will find nothing but checks.

Take your veneer and soak it in water, preferably warm. After the veneer has become soft and pliable, allow the water to drain off. Take your veneer and place singly between two boards of a soft, absorbent nature. These boards must be heated so that you have difficulty in handling them. Place in the press and after two or three hours it may be taken out. It will then be straight and ready to lay. As a rule it is only the figured veneer that buckles. If treated in the above way the buckles can be got out easily and to advantage. If you rub powdered asbestos well into the headwood before gluing, it will prevent checking. The ordinary plain veneer hardly ever requires any straightening. Any veneers found to be buckled which may likely cause air pockets in gluing up, should be first shrunk and flattened between heated cauls.

When veneers have to be jointed up to make the required width, the taping machine is very useful. This machine splices the veneer together with gummed paper tape, making practically invisible joints. If a taping machine is not available, then tack down your veneer on a table with joints closed, glue tape over joints, gummed muslin being preferable. After being taped the edges of each taped joint should be glued together, this process preventing open joints or hair lines often seen in veneered work. Much care should be taken in having the core stock in good condition.

The wavy appearance of what would otherwise be a fine top is a problem often faced in the finishing room. It is due to the veneer being laid on a core stock coming direct from the planer, or is caused sometimes by the shrinkage of the core stock. Having the core stock dry and well prepared are two essentials that should not be neglected. After veneers have been glued and taped they are ready for gluing. The crossbanding is the part that is glued.

In assembling and gluing, lay out the first veneer and feed the crossbanding through the spreader. One man feeds the spreader, a second receives the glued stock and lays the veneer, a third lays the face veneers and cauls. In this process have everything to hand and yet not in the way. Do not make two moves where one will do. Do not handle the work too many times. See that your work is glued and properly done. After removal from the press the stock should be stacked up and kept until the glue moisture has dried out thoroughly. A dryroom is very useful for the stacking of this stock. Place strips between when stacking. This room should have a temperature of 75 to 85 degrees Fahr.

The question is often asked: how thick should crossbanding be? That depends much on the kind of work for which it is intended. Some crossbanding is used to add strength and durability and some is not; it merely depends on the work. There is danger, however, in using heavy crossbanding, which, if not properly used, tends to make matters worse.

Heavy crossbanding, rightly used, will hold a heavy core body; if wrongly used it may become a source of danger, and may even spoil and break the face veneer.

Here, it might be asked, whether it pays to allow the cabinet-maker to veneer his own tops or shelves, etc., on the edges connected with his work. I believe it does. A man of my acquaintance was employed in a certain factory in Ontario about eight years ago. One of his first jobs was fifty mahogany dressers, the tops of which had to be veneered on the front and ends. This is the way he did it: he had veneer cut one-eighth larger in length and width than he wanted it; he glue-sized the tops on three sides, thus forming a foundation for the end wood especially; then he got a pail of warm water and wet the veneers. He laid the veneer on the ends of all the tops, piling the tops one upon another and putting strips between them. After laying the ends, he laid the front veneers, piling them up again in the same manner. After having allowed the tops to dry out, he set to work and cleaned the tops up on the front and ends and then sent all the tops to the sandpaper machine to be cleaned on the surface. These tops cost ten cents apiece to veneer and clean up. To-day in the same factory all veneering on the fronts and ends is done practically on the same principle, which certainly pays.

The writer has been using veneer on and off for over twenty years and never had the slightest trouble with crossbanding or straight veneering tops on the above method, which for narrow stock is profitable if handled properly. The handling in this method is the chief problem.

The illustration herewith shows a veneer hammer for use in veneering ends and fronts of tops, etc. After the stock is veneered care should be taken in piling. Unfortunately some neglect this, which frequently means more trouble for the finisher. Though the crease is sandpapered out it rises again in the finish. If there are indentations in the stock a sponge should be taken and water drawn across these to swell back again. Built-up stock should be handled carefully, but there is nothing that is not benefited by careful piling, while passing through the different processes of seasoning or manufacture.

In the manufacture of furniture and panels, etc., built-up stock and veneers will be used more freely in future than is the case today. Much more beautiful effects can be obtained with veneers, and the best of woods are used in its manufacture. At present veneered furniture is more sought after, and besides it is the highest priced. The veneered panel is admitted to be the strongest, and built-up stock and veneers, if handled properly, will give the greatest satisfaction.

Points to be Observed in the Purchase of Veneers*

By Alexander T. Deinzer

The common weakness of many furniture manufacturers, whether buying lumber, glue, varnish, veneer, or anything else, is to make a drive at saving money in the first cost, to try to buy it cheaper, to pick up bargains.

The first thing of importance, and the thing that should dominate in shaping the purchase of veneer, is to get the best stock possible for the purpose in hand. Ruptured veneer is, in my opinion, expensive at any price. I have been told that some of the manufacturers receiving veneers with the fibre broken will run it through rollers to press the fibres together again. Veneer is thin, at best, and if subjected to sufficient pressure to force the broken fibre together again, the unbroken parts will be crushed and bruised in the process. You can buy ruptured veneer very cheaply indeed, and there are furniture manufacturers in business to-day who are buying this grade of veneer and believe they are getting a bargain.

Space does not permit writing any more about the question of buying but enough information has been given to show how really important is the knowledge to select veneers.

A good idea in purchasing veneers is to make triplicate copies of the order. The original being handed to the salesman or mailed to the veneer company, a copy to the veneer inspector or the man having charge of the veneers and a copy retained in the purchasing

---

*Abstract of an article in the Furniture Manufacturer and Artisan.

Do Not Overlook the Furniture Exhibitions !

Readers of the Canadian Woodworker are reminded that the Berlin and Waterloo Exhibition is scheduled for January 11-16 and the Toronto Exhibition for January 18-February 1. Reports of both events will be featured in the February issue of the Canadian Woodworker.

department. In all cases keep the samples of the flitches you buy and compare them with the stock when it arrives. Have all the veneer inspected and measured as soon as received. A good idea is to give a lot number to each log and report this number to the cost department and to have all piles of veneers numbered, keeping an account of every pile as you would the lumber in your lumber yard. Whenever the veneer cutter takes veneer from the pile, he must report the quantity to the inspector, or, if the factory is large enough, the veneer should be delivered only when a requisition is presented. This requisition should bear the job number for which it is intended and is, of course, returned to the cost department. There are several advantages in using a system of this kind:

First—You know the exact amount of veneer required for the job.

Second—You eliminate waste, for your men know very well that they must account for every foot.

Third—You know when your veneer is running low and have sufficient time to order, not depending on Smith or Jones to report and possibly hold up the veneer room on account of delay in not getting the stock.

Fourth—You have a perpetual inventory of all veneers and you can tell within just a few minutes how many feet of each lot you have on hand. Simple? Of course it is. Besides the nicety of this system, it lends a great deal to general carefulness throughout the handling of the veneer. Try it and see what you think of it.

There are many veneer buyers who will buy very narrow stock, saving a few dollars per thousand when they really require principally wide stock, or possibly both. You must remember that the great advantage in buying wide stock is in the beautiful figure effect. Again, it costs money to joint, match and tape veneer.

Study the conditions of your veneer room. You should be able to determine what you require and buy accordingly. There is one best way to do everything. If the manager, superintendent and foremen know "how" you can manufacture furniture at lower prices, increase sales, raise capital and earn profits.

The Glue Tank

Until recently the glue tanks used in veneering, gluing and cabinet departments were the crudest, the meanest and the most neglected in the long list of equipment required in a woodworking establishment. For years glue was heated in open pots, and we all know that evaporation weakens glue; makes it too thick for use, and also makes it very uneven in quality. An improvement in the right direction was to put a cover over the tank or glue cooker and to provide the cooker with a stirring rig. I have been asked at various time: "Is it well to stir glue while being dissolved?" There is no objection whatever to this method and, in fact, in many cases where the goods are used very heavy and in large quantity, agitation by paddles is often necessary to secure prompt and efficient results. The only objection I know of is that it raises scum and foam that otherwise would not be apparent, but this can always be overcome by the consumer using glue that works free from foam, whether agitated or not. In many furniture factories one will find the old style iron kettle. Iron equipment is expensive for the reason that it will not stand up with copper, brass or aluminium. Iron rusts, and the rust impairs the color and quality of the glue liquid, and copper, aluminium or brass are practically self-cleaning.

When buying a glue tank select one having a greater height than diameter. A high tank with a small diameter is decidedly preferable to a wide and shallow tank. You will appreciate that the stirring rig can work better than in a tank being low and wide. It should have an air-tight glue chamber (to prevent evaporation) and surrounded by a water jacket, the water in the jacket being heated either by direct injection of steam or by use of copper heating coils. Some of the progressive factories are using electricity to heat their glues. Be sure you have a thermometer on the cooker and have this attached in some conspicuous part of the cooker so that the man preparing and cooking the glue can watch the temperature. Do not at any time permit the temperature to exceed 150. This is a great fault in most of the furniture factories. Time and again I have observed the temperature from 165 to 200. From force of habit I observe the temperature whenever I pass a glue cooker. It is very seldom that I find the temperature at 150, or below that point. One hundred and seventy degrees seems to be the favorable point with most glue men. It is not uncommon to find plants in which glue is prepared by subjecting it to the direct application of steam. So many workmen labor under the impression that it is necessary to heat the glue at a very high temperature in order to dissolve it. This is a mistaken idea. If the glue has been properly softened, it will dissolve at a low temperature.

(Concluded in next issue.)

Mr. B. L. Nowell has recently joined the Perkins Glue Company, of South Bend, Indiana, as Canadian representative, and will make his headquarters in Montreal. Mr. Nowell has had a wide experience in different branches of the glue business and recently became so impressed with the progress which vegetable glue is making that he decided to establish a connection with the Perkins Company. It is his opinion that vegetable glue will be most largely used in the future.

From the American Veneer Company, specialists and manufacturers of built-up veneer panels and veneer seatings, Hoboken, N.J., we have received a good plain office calendar which serves as a reminder of the activities of this firm. The company manufacture built-up panels for wainscoting, doors, partitions, bank fixtures, counter tops, desk and table tops, special furniture, vehicle bodies, and veneer seatings for cars and depots, settees, lodge and church furniture, also car ceilings.

Mr. Reginald Bartlett, of Toronto, President of the Bartlett Automobile Company, has signed agreements with the authorities at Stratford, Ont., for taking over either the Morlock or the Diebel furniture factory, both being now partly completed in Stratford South. Whichever building is finally accepted will be pushed to completion. Mr. Bartlett states that fifty hands will be employed by January. The company has leased a factory in Toronto, but Mr. Bartlett states that the Stratford establishment will be made the parent plant. It is claimed that the company is capitalized at one million dollars.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

Write for a quotation on this space—it will put you in touch with veneer users.

HB **Hoffman Bros. Co.** HB

Reg. U.S. Pat. Off.

Estab. 1867, Incor. 1904—"Nuff said"

800 West Main Street,
FORT WAYNE, INDIANA

Manufacturers of

VENEERS and LUMBER

In the Domestic Hardwoods

ANY THICKNESS.

1/24 and 1/30 Slice Cut
(Dried flat with Smith Roller Dryer)

1/20 and thicker Sawed Veneers,
Band Sawn Lumber.

—SPECIALTY

HB **Indiana Quartered Oak** HB

Reg. U.S. Pat. Off.

Circassian Walnut Lumber

½ in. Veneer Slabs and Log Run	-	-	1200 ft.
⅝ in. " " "	-	-	2135 ft.
¾ in. " " "	-	-	1685 ft.
1 in. " " "	-	-	2070 ft.
1¼ in. " " "	-	-	840 ft.
1½ in. " " "	-	-	175 ft.
2 in. " " "	-	-	430 ft.

PRICE:
15c. per ft.
f.o.b.
Chicago

HUDDLESTON-MARSH LUMBER CO., 2256 Lumber Street
CHICAGO, ILL

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Cincinnati Veneer Company

Manufacturers of - - **Veneers** *and Thin Lumber in all Thicknesses*

Poplar, Oak, Walnut, Gum, Maple, Ash, Rotary, Sawed and Sliced Cut

We are in a position to quote low prices and make prompt shipments. Stock all well manufactured from selected logs and roller dried.

Cincinnati - - - - Ohio

Walter Clark Veneer Co.

GRAND RAPIDS, MICH.

Our Investment for You!!

We carry a large stock in our warehouses ready for immediate shipment.

We are in a splendid position to fill your RUSH orders for:

Rotary Cut Birch, Gum, Poplar and Oak,

Sawed Quartered and Sliced Quartered White Oak.

The above carried in all thicknesses.

Prompt Shipment also on Dimension Cut Stock

Goshen Veneer Co.

GOSHEN, INDIANA

Does Experience Count?

¶ We have been making veneers of quality for over fifteen years.

¶ We are sure that our stock, our method of doing business and our prices will more than please you.

Write us to-day for

Poplar and Red Gum Veneers and Crossbanding

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in the "Canadian Woodworker." They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend the time and money to get in touch with you. He deserves it—if his stock and prices are right.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

PENROD WALNUT & VENEER CO.

Mills, Kansas City and Helena, Ark.

Send all enquiries to

GENERAL OFFICES - KANSAS CITY, Mo.

Kansas City Plant Exclusively

WALNUT

LUMBER AND VENEERS

American and Circassian

Helena Plant Exclusively

Rotary Cut Veneers

Red Gum — Oak
Poplar — Elm
Cypress — Pine

Dry, Flat Stock

Penrod-Jurden-McCowen Lumber Company

Band Mills: Brasfield, Arkansas

Address all enquiries to

SALES OFFICES - KANSAS CITY, MISSOURI

We offer for immediate shipment DRY

RED GUM

Quartered

3 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
3 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

RED GUM

Plain

4 cars 4/4, 1's and 2's
2 " 5/4 "
1 car 6/4 "
1 " 8/4 "
1 " 10/4 "
2 cars 4/4 No. 1 Com.
1 car 5/4 "
1 " 6/4 "
1 " 8/4 "
1 " 10/4 "

THE FAMOUS CACHE RIVER GUM

Band Sawn Flat - Dry

Plain and Quartered Red and White Oak always in stock

We specialize on

Poplar

cross-banding and backing

Veneer

Highest Grade — Right Prices

The largest Poplar Veneer Mill in the world.

The Central Veneer Co.

Huntington, West Virginia

VENEERS

Wisconsin Birch and Basswood

A SPECIALTY

All Thicknesses—Log Run or Dimension Stock

PANELS

Quartered Oak — Quartered Gum
Mahogany — Walnut

All Thicknesses - All Sizes

Tell Us Your Wants.

Wisconsin Seating Co.

Manufacturers

NEW LONDON, WISCONSIN, U.S.A.

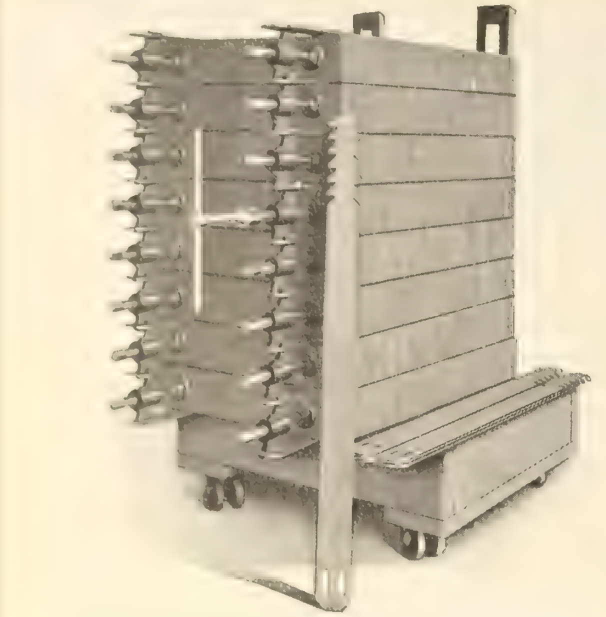


Table Leg Clamp manufactured by Albert E. Palmer & Sons, Owosso, Mich.

A New Table Leg Clamp

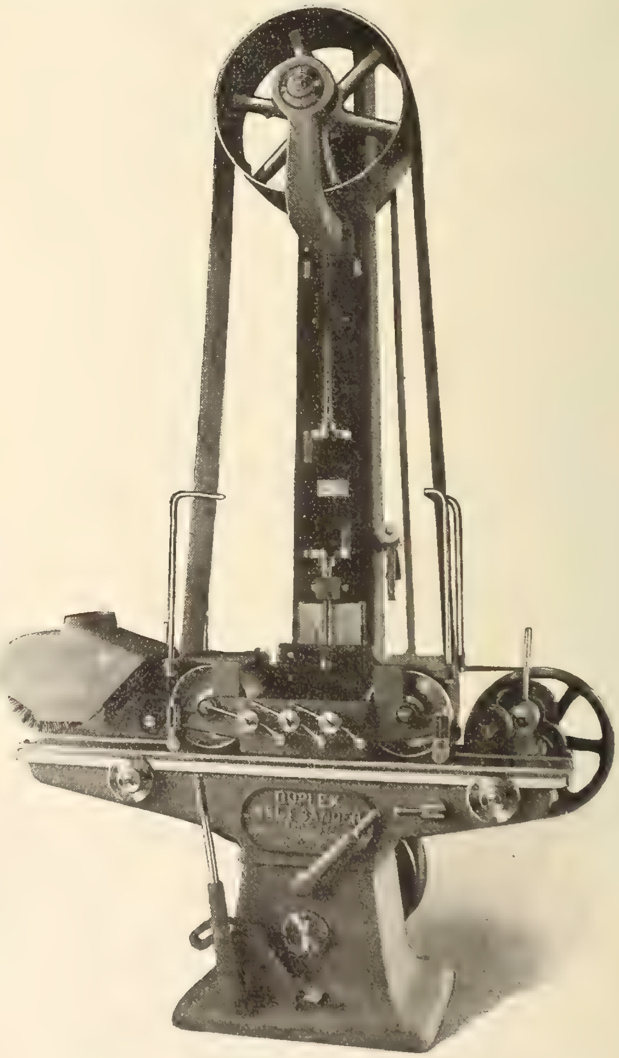
ILLUSTRATED herewith is a perfectly original idea in the shape of a table leg clamp, which has been turned out by Messrs. Albert E. Palmer & Sons, of Owosso, Michigan. The general plan of this clamp is the same as that of the lever clamp turned out by the same firm, it being built up from the bottom and used on special trucks, as shown, or on ordinary trucks, benches or base blocks. The notch bars are steel, 3 inches wide and 3-16 of an inch thick. These can be had in any length. The clamp head is made of the best quality of malleable iron fitted with steel screw 1 inch in diameter, 9 inches long, with six threads to the inch. Screws are squared on the out end to fit Tee wrench, which is of sufficient size to give ample power. The clamping outfit will take stock from 2½ to 7 inches in thickness and 36 inches in width. The firm also furnish a clamp of similar design for stock from 2 to 3 inches in thickness and of any width to suit the purchaser.

According to the Forest Branch department, two hundred million feet, board measure, of wood a year are required by the various industries of the Maritime Provinces that use wood as their raw material—not to speak of the many millions of feet of timber used in rough building construction, for poles and railway cross ties, fuel and the many other uses of timber. The value of the timber used is nearly $3,700,000, and of this amount only 12.3 per cent.—about 25,000,000 feet—was imported. Twenty-eight kinds of wood are used in the industries, spruce occupying first place.

The Westminster Timber Company, Limited, of New Westminster, B.C., is entitled to credit for having shipped to an Everett, Wash., mill the biggest boom or raft of cedar ever floated on Puget Sound. The raft, containing one million feet, was originally destined for the Phoenix Mill, Ballard, Wash., but the draught was such that the captain of the tug realized he could not deliver it at that mill, so turned into Everett to await instructions from the owners. The raft was finally purchased by the Jamieson Lumber & Shingle Company, of Everett, who broke it up and divided the timber among their several plants. The venture is said to have resulted in a loss for the shippers owing to the heavy export and towing charges, and the fact will likely discourage further shipments.

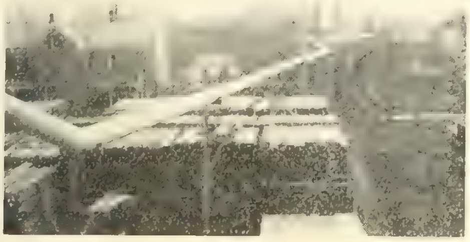
The Duplex Belt Sander

THE machine illustrated herewith has been designed specially for the rapid sanding of narrow, flat surfaces and where extra fine finish is required, at a low cost for operator and material with which the sanding is performed. The main feature is the automatic adjustment of sand belt upon a large working surface while work is passing under the belt taking care of slightly warped surfaces and "chatter marks." The machine is constructed to handle stock from ⅜ in. to 4 in. in thickness up to 10 in. in width. Paper or cloth belts can be used in any widths up to 12 inches and from 18 to 20 feet in length. The feed is controlled by two speeds from 35 to 40 lineal feet a minute to suit the condition of work. A rotary adjustable brush, with suction hood, is mounted on the out-feeding end to carry off the dust from the work, as well as from the sand belt. All fast-running shafts are perfectly balanced and mounted on ball bearings of the best quality, reducing the bearing friction, as well as oiling, to a minimum. The feed bearings are lined with bronze, provided with oiling devices and protected from dust. From three to four h.p. is required to drive the machine on a clutch pulley which is mounted in the rear on lower base and can be driven from any direction by line shaft or motor direct. No countershafts are required. The most practical ideas of sanding, as well as workmanship and material, have been incorporated in the construction of this type of machine. The machine is built by the Duplex Moulding Sander Company, Hornell, N.Y.



Belt Sander manufactured by the Duplex Moulding Sander Company, Hornell, N. Y.

Slow Speed Low Power Shaving and Dust Collecting Systems



New Systems designed. Old systems corrected.
Long distance blows a specialty.

Trained Mechanics. We know how.

Consult our Expert

INVINCIBLE BLOW PIPE CO.
CHICAGO 176 George St., TORONTO

PATENTS
STANLEY LIGHTFOOT
Registered Patent Attorney
Lumsden Building (Cor. Adelaide & Yonge Sts.) TORONTO, CAN.

The business of Manufacturers and Inventors who wish their Patents systematically taken care of is particularly solicited. Ask for new free booklet of complete information.

PATENTS
Herbert J. S. Dennison, Patent Attorney and Expert

Patents, Trade Marks, Designs and Copyrights obtained in all countries.
18 years' experience in Patents and Practical Engineering.

Star Bldg., 18 King Street West
TORONTO
Write for Booklet

7% INVESTMENT 7% PROFIT SHARING

Sums of $100, $500, $1000 and up. Safe as any mortgage.
Business at back of this Security established 28 years.
Send for special folder to

National Securities Corporation, Ltd., Confed. Life Bldg. TORONTO

OVER 65 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents.

Patents taken through Munn & Co. receive *special notice*, without charge, in the

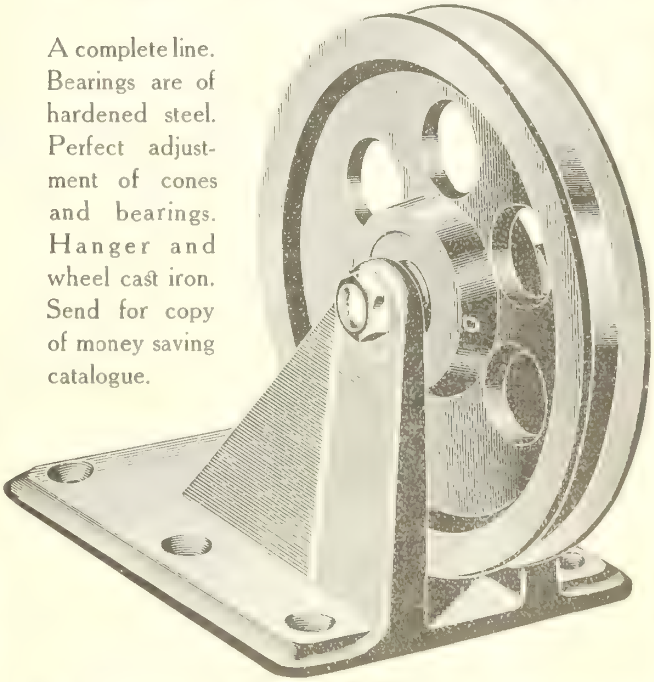
Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms for Canada, $3.75 a year, postage prepaid. Sold by all newsdealers.

MUNN & Co. 363 Broadway, **New York**
Branch Office, 625 F St., Washington, D. C.

Wall Case Pulleys

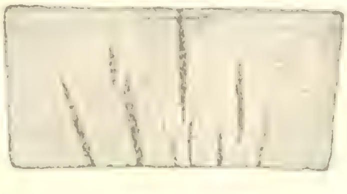
A complete line. Bearings are of hardened steel. Perfect adjustment of cones and bearings. Hanger and wheel cast iron. Send for copy of money saving catalogue.



Reflector & Hardware Specialty
Manufacturing Company
Western Ave. at 22nd Place, CHICAGO, ILL.

Every kind and form of
DRYING LUMBER

Grand Rapids Dry Kiln
QUALITY DRYING
Grand Rapids
Mich. - U. S. A.



Veneer Press Agency

If you are interested in securing an agency for a high grade veneer press now manufactured and sold largely in the United States, write us. Catalogue will be sent you on request and we will arrange interview in Toronto or Montreal as desired. Reply to Box 40, Canadian Woodworker, 345 Adelaide Street West, Toronto, Ontario. 11-12

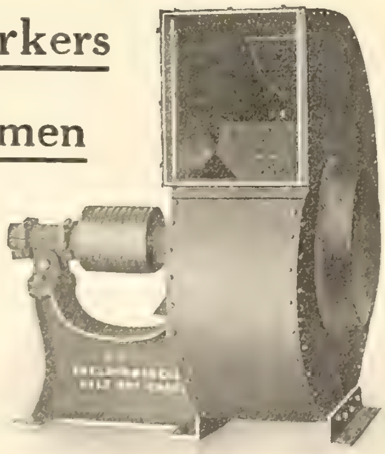
Salesman's Opportunity

We want to get in touch with a good live Salesman who has a line of domestic veneers and would be willing to handle mahogany and Circassian walnut also. Commission basis believed to be best arrangement, but would gladly consider any proposition made. Write at once, giving particulars of experience and connection. Box 39, Canadian Woodworker, 345 Adelaide Street West, Toronto, Ont. 11-12

Hardwood Salesman Wanted

Wanted a high grade Hardwood Salesman who is thoroughly acquainted with the furniture, piano and interior finish trade of Canada. We can offer such a man an exclusive territory in a well established line. Send full particulars and references in first letter or application will not be considered. Address Box 38, Canadian Woodworker, 345 Adelaide Street West, Toronto, Ont. 11-12

Woodworkers and Lumbermen



The Sheldon Exhaust Fans have characteristics that adapt themselves to the service of the Planing Mill or Woodworking Plant. They are specially designed for this kind of work, having a saving in power and speed of 25% to 40%.

Write for Industrial Booklet.

SHELDONS LIMITED - Galt, Ont.

Toronto Office, 609 Kent Building

— Agents —

Messrs. Ross & Greig, 412 St. James St., Montreal, Que.
Messrs. Walker's Limited, 259-261 Stanley St., Winnipeg, Man.
Messrs. Gorman, Clancey & Grindley Ltd., Calgary and Edmonton, Alta.
Messrs. Robt. Hamilton & Co., Ltd., Bk. of Ottawa Bldg, Vancouver, B.C.

News of the Trade

The Bordeaux Sash & Door Company, Limited, Montreal, has registered.

The James Smart Manufacturing Company, Brockville, Ont., are installing machinery in their new woodworking plant.

The Canadian Western Lumber Company, Fraser Mills, B.C., have contributed two car loads of wood to the war relief fund.

The sawmill belonging to Mr. Arthur Moore at Falconburg, Ont., was recently destroyed by fire. The stock of lumber was saved.

The plant of the Toronto Wood Products Company at Donald, Ont., has resumed operations, and a large staff of men will be employed.

At Edmonton, Alta., the sawmill of the North Alberta Lumber Company is practically completed and machinery is at present being installed.

Mr. James Gillies, Preston, Ont., is contemplating the purchase of sash making machinery, as he intends to go into the manufacturing of sash, window frames and screens.

At Listowel, Ont., the planing mill, with subsidiary buildings, owned by Messrs. Oliver & Ellis, was destroyed by fire a few days ago. The loss was about $2,000, with insurance of $1,000.

A new sawmill will be erected at Tobacco Plains, near Elko, B.C., by the Eureka Lumber Company. The cost of the plant will be $150,000 and it will be thoroughly modern in every respect.

At Hull, Que., the furniture store owned by Mr. Joseph Jaquin has been destroyed by fire. The loss to the building amounted to $4,000, and to stock $25,000. The amount of insurance is stated to be $9,000.

According to a report from Victoria, B.C., about 200,000,000 feet of hemlock and spruce timber have been sold by the government to the B. C. Sulphite Fibre Company, Limited, operating at Mill Creek, Howe Sound.

The Berlin branch of the Canadian Furniture Manufacturers, which was closed in June, has resumed operations with a large staff of men to work eight hours a day, five days a week. The surplus stock which was formerly on hand has been entirely disposed of.

At Brantford, Ont., Messrs. Reid & Brown, 151 Colborne Street, are erecting a two-storey, 32 x 100 ft., furniture store which will have a pressed brick front and will be of sand-lime brick construction. The plant will involve an outlay of approximately $7,000.

The Forest Mills of British Columbia, Limited, Revelstoke, B.C., report that their recent loss by fire at Compalix resulted in the total destruction of their saw and planing mill, together with considerable yard equipment. This was the best of the four mills operated by the company. Its equipment consisted of one 9-ft. double-cutting band mill and one 8-ft. band mill. At the time of the fire the mill was closed down temporarily owing to trade depression. The stock of manufactured lumber in the yard, which was all saved, amounted to 14,000,000 feet. The loss was fully covered by insurance and the mill will be rebuilt, probably next spring. About 140 men were employed.

For Sale

Cabinet Machinery consisting of gang dovetail, No. 3 Waymouth lathe, saw tables, Rogers moulder, Boult carver, White shaper, etc. J. L. Lucas & Son, 3 Fox Street, Bridgeport, Conn. 12-1

WOODWORKING MACHINERY

More than
1,000
Second-hand
Machines,
Renewed and
Guaranteed.

52 Lines
of New
Machinery
the Largest
Stock in
the World.

Section of main floor Exhibit and Salesrooms

CHICAGO MACHINERY EXCHANGE, Inc.,
1219-1227 Washington Blv'd.
CHICAGO, Ill., U. S. A.

"Andrews" Dried Lumber
IS BETTER LUMBER

"ANDREWS" Products Represent
Perfection—Reliability—Results

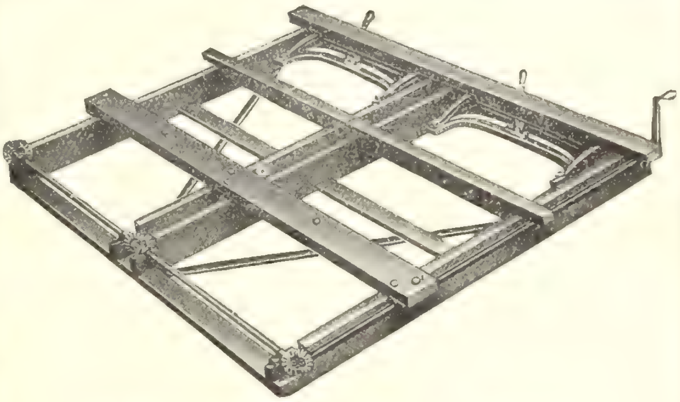
"Andrews"
Moist Air
Lumber
Driers

CONDENSING
or
VENTILATED

Perfect Transfer Cars
Perfect Dry Kiln Trucks
Canvas Dry Kiln Doors
Double and Single

Write for Information

DRIER DEPARTMENT
The A. H. Andrews Co.
115-117 South Wabash Ave.
CHICAGO



GRAND RAPIDS
Dependable Factory Furnishings

Benches, Hand Screws,
Glue Clamps, Trucks.

Write for Catalog No. 21.

GRAND RAPIDS HAND SCREW CO.
1456 Front Ave. Grand Rapids, Mich.

Plain Sawed Oak

Mills in West Virginia and Kentucky

Wilcox & Knapp
Conneautville, Pa.

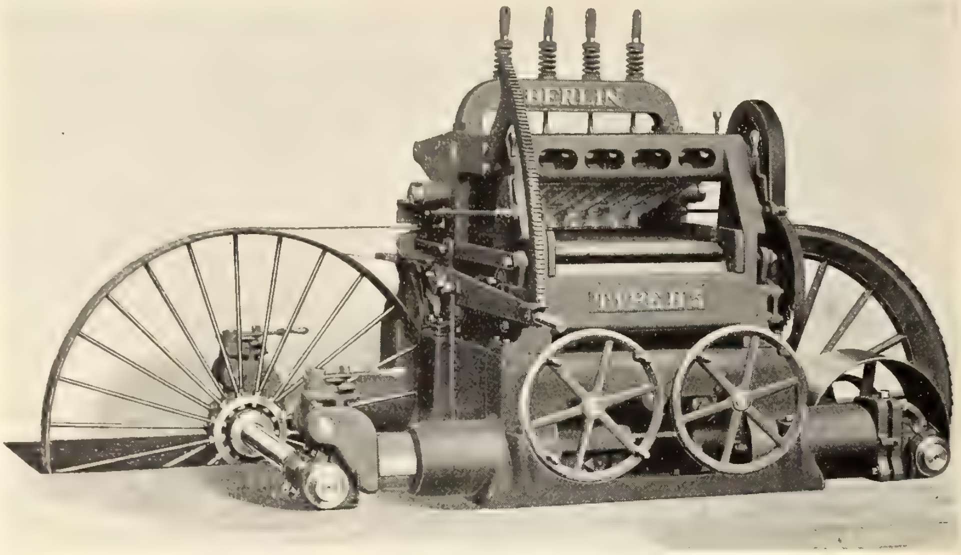
Quotations Cheerfully Furnished

BUSINESS AS USUAL

Your Inquiries Solicited for
Pine, Spruce, Hemlock,
Hardwoods, Lath

Good Stocks Prompt Shipments Satisfaction

C. A. Spencer
603 Eastern Townships Bank Building,
MONTREAL



New Slab Band Resaw. Berlin Machine Works, Limited, Hamilton, Ont.

New Slab Band Resaw Combines Simplicity, Strength and Light Weight

LUMBERMEN and woodworkers in general will be much interested in the new slab band resaw shown in the accompanying illustration. This is the latest production of the engineering staff of the Berlin Machine Works, Limited, Hamilton, Ont., and represents in its design and construction the experience gained by this concern during its many years as builders of band sawing machinery.

This new unit is designed to assist in the manufacture of lumber, to receive slabs or flitches and convert them into marketable lumber at a low cost. In every detail the resaw is simple in design and operation and sturdily constructed. Realizing the great advantage of a short, stiff saw on a resaw of this type, the designers of the machine have brought the wheels very close together. The saw cuts on the top tangent and maintains a fixed position. The wheels are 64 inches in diameter, and are designed to receive 8-inch blades.

As a design feature the use of an endless travelling bed in a resaw of this type is not a new departure, but the bed of this new resaw differs somewhat from the conventional design inasmuch as it combines simplicity, strength and light weight. Even under the hardest service, its builders claim, it will show very little wear, as the slats are made of steel and slide on a broad machined table, or way.

The bed is adjustable and may be quickly placed in position for cutting different thicknesses of material. A counter-balanced lever, providing a leverage of 12 to 1, makes this adjustment easy. The extreme maximum position of the bed below the saw is 4½ inches.

The overhead spur-toothed rolls are divided into four separate feeding units, each pivoting independently. The rolls will adjust themselves automatically to uneven surfaces, and where the slabs to be resawed are sufficiently narrow to permit, two or more may be resawed at once, thereby greatly adding to the machine's capacity.

The rolls will rise 8 inches above the saw, and this, together with the 4½ inch adjustment of the bed below the saw, and the 28-inch width of the table, provide ample capacity for handling any slabs the average sawmill will be likely to produce.

The resaw will operate on flitches as well as on slabs. All that it requires of material delivered to it is one sawed surface. Four rates of feed are provided, from 50 to 150 feet per minute.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Canadian Woodworker" may obtain the names of enquirers by writing to the Department of Trade and Commerce and stating the number of the enquiry.

1201. **Wood pulleys.**—A first-class Glasgow house is desirous of getting in touch with manufacturers of wood pulleys. This is an important firm in this line of business.

1202. **Piano actions and parts.**—A Glasgow manufacturer wishes to purchase above.

1205. **Leather polish.**—A Paris agent is anxious to open connections with manufacturers of leather polishes of all kinds to introduce them on the French market in place of similar products formerly imported from Germany.

A giant flagpole was shipped to London early in November by the B. C. Government, to decorate the front of the provincial office building in the world's metropolis. The pole is 230 feet in length, and is four feet in diameter at the butt. It is a fine specimen of Douglas fir, and should attract attention to our timber wealth.

The Classic Furniture Company, Limited, Stratford, Ont., reporting to the Canadian Woodworker, stated that the fire which broke out in their factory on the evening of November 12 wiped out practically everything but the lumber piled in the yard. The plant and stock were valued at about $45,000. The factory will not be rebuilt, the company having made arrangements to take over the factory of Stratford Desks, Limited, and continue their business there for the time being. They expect to be able to overhaul some of their own machinery and also have the use of additional machinery in the desk factory.

The 13th annual convention of the Hardwood Manufacturers' Association of the United States is to be held at the Hotel Sinton, Cincinnati, January 28-29 next. Arrangements are proceeding rapidly and the Secretary, Mr. H. Weller, reports every promise of an excellent meeting.

The Atlantic Lumber Co.

Manufacturers and Wholesale Dealers

American and Canadian Hardwood Lumber and Mahogany, Quartered and Plain, White and Red Oak a Specialty.

110 Manning Chambers - **TORONTO**
Phone Main 6386

HOME OFFICE, BOSTON, MASS.

Mills: KNOXVILLE, TENN., WALLAND, TENN.
FRANKLIN, VA.

J. V. STIMSON

All kinds of

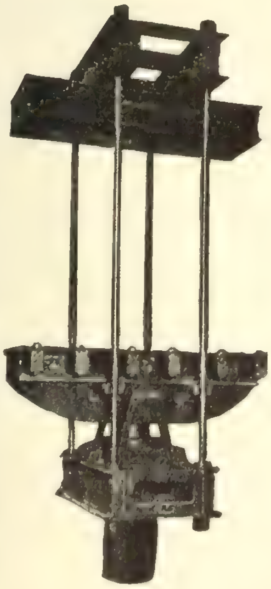
Hardwood Lumber

MANUFACTURED

HUNTINGBURG - INDIANA

Mills at ***Owensboro, Ky.,*** and ***Memphis, Tenn.***

Hydraulic Veneer Press



We build these presses in all sizes and styles for all kinds of Veneer work

Write us for Price

William R. Perrin & Company
Limited
TORONTO

Archer Lumber Company

HARDWOOD LUMBER

Helena, Ark.

PLAIN RED GUM	QTRD. RED GUM
4/4 1s & 2s 171812	4/4 1s & 2s 12000
4/4 No. 1 C. 433970	4/4 No. 1 C. 49187
5/4 1s & 2s 46339	5/4 1s & 2s 12530
5/5 No. 1 C. 30140	5/4 No. 1 C. 15682
6/4 1s & 2s 37375	6/4 1s & 2s 10000
6/4 No 1 C. 71172	6/4 No. 1 C. 27584
8/4 1s & 2s 36237	8/4 1s & 2s 10000
8/4 No. 1 C. 31552	8/4 No. 1 C. 5600

SAP GUM

4/4 13-17 in. Boxboards 28718
4/4 18 in. and up Panel 33905

OHIO
Hardwood Manufacturers and Dealers

THE PRENDERGAST COMPANY
Cincinnati, Ohio

OAK
4/4, 5/4, 8/4, 12/4 and 16/4 No. 1 Com. and Fas.

DIMENSION STOCK
We give special attention to the manufacture of dimension oak and are prepared to cut stock to order.

CHESTNUT
4/4 and 6/4 all grades.

BASSWOOD
4/4 and 5/4 Log Run

YELLOW PINE
5 cars 4/4 Short Leaf Steam Dry Finish
3 cars 4/4 Short Leaf Air Dry Finish
2 cars 4 in., 5 in. and 6 in. Turning Squares

The Talbert - Zoller Lumber & Veneer Co.
CINCINNATI -:- OHIO

Manufacturers of

Ohio and Indiana High Grade Oak Lumber and Veneers

We have at our Cincinnati mill the following stock in Dry shipping condition:

2 cars 8/4 1st and 2nd Plain White Oak.
3 cars 4/4 1st and 2nd Plain White Oak.
1 car 4/4 1st and 2nd Plain Red Oak.
1 car 4/4 No. 1 Common Plain Red Oak.
1 car 5/4 1st and 2nd Plain Red Oak, 11 in. and up.
1 car 16/4 1st and 2nd Tough White Ash.
1 car 10/4 1st and 2nd Tough White Ash.
5 cars 4/4 No. 1 Common Tough White Ash.
2 cars 4/4 No. 1 Common Qtd. White Oak Strips.

Also large stock of Quarter Sawed Oak Veneers of the finest texture, color and figure. Send for Sample and Price.

We do not sell anything but our own manufacture.

Distributing Yards:—Baltimore, Md. Cincinnati, Ohio

The Kosse, Shoe & Schleyer Co.
CINCINNATI, OHIO

Anything in

Black Walnut Lumber

SEND US YOUR INQUIRIES

Soft Yellow POPLAR
Extra Wide 1, 2, 3 and 4 inch 5/8" PANEL STOCK
6" x 6," 7" x 7" and 8" x 8" Squares

Hardwoods of all kinds
Mahogany—Oak
Hickory Lumber, Hickory Axles, Cypress

Charles F. Shiels & Co., Cincinnati, O.

ANY CHANGE In the map of Europe will in no way affect the color or texture of our lumber. It will always be the same uniform, soft textured, even (white) colored stock as before.

Our Own Timber — Our Own Mills — Our Own Organization

The Mowbray & Robinson Company
"Manufacturers"
Cincinnati, Ohio

YARDS:
Detroit, Mich.
Rochester, N. Y.
Brooklyn, N. Y.
Cincinnati, O.

MILLS:
Quicksand, Ky.
West Irvine, Ky.
Viper, Ky.
Hombre, Ky.

OHIO
Hardwood Manufacturers and Dealers

The Thompson Hardwood Lumber Company

Office and Yards:
Liberty and McLean Ave.,
Cincinnati, Ohio

CINCINNATI, OHIO
—We make a specialty of—

Mills:
Kentucky Tennessee
W. Virginia

Soft Texture Red and White Oak

Quartered, Sawed and Plain

Also manufacture and carry in stock a large assortment of

DRY — POPLAR — ASH — CHESTNUT — BASSWOOD

Can supply in any thickness from 4/4 to 16/4 **Wire our expense if in need of any of above stock.**

Shawnee Lumber Company

CINCINNATI, OHIO

OUR SPECIALTY IS OAK

WE carry large stocks of Oak, Poplar, Chestnut, Hickory, Maple, Basswood and Gum.

If we haven't in stock what you want, we can saw it for you and ship promptly right from the saw.

We operate our own mills.

Write us today and send us your inquiries.

Immediate Shipment

West Virginia Stock

Thoroughly Dry and Well Manufactured

1 car	4/4	1s and 2s, Plain White Oak.
4 cars	4/4	No. 1 Common Plain White Oak.
2 cars	4/4	No. 2 Common Plain White Oak.
1 car	4/4	No. 1 Common and Better Plain White Oak. Worm holes no defect.
1 car	6/4	No. 1 Common Plain White Oak.
6 cars	4/4	S. W. Chestnut.
1 car	5/5	S. W. Chestnut.
4 cars	6/4	S. W. Chestnut.
1 car	8/4	S. W. Chestnut.
3 cars	4/4	No. 3 Common Chestnut.
1 car	4/4	No. 1 Common and Better Chestnut.
½ car	8/4	No. 1 Common and Better Chestnut.
1 car	4/4	Saps and Select Poplar.
2 cars	4/4	No. 2 Common and Better Poplar.
1 car	5/4	No. 2 Common Poplar.
1 car	6/4	No. 2 Common Poplar.
1 car	4/4	No. 2 Common and Better Birch.

We solicit your inquiries on special cut bill Oak.

Mill at Holly Junction, W. Va.

Write at once for Quotations. **The Price is Right.**

The Imperial Lumber Co.

Columbus, :-: Ohio.

DUHLMEIER BROTHERS

Mills—TENNESSEE ARKANSAS **Main Office & Yard—CINCINNATI, OHIO, U.S.A.**

OAK and RED GUM

OUR SPECIALTY

Our Gum comes from Arkansas—the Finest in the World—Nice Band Sawn Stock.

At our Tennessee mill we are producing some choice Band Sawn

Plain and Quartered Red and White Oak, Poplar

Prompt Shipments and High Grades our Hobby. **Mahogany** Let us quote you on your requirements.

The "Canadian Woodworker" Buyers' Directory

For Alphabetical Index see page 10

ABRASIVES
The Carborundum Co., Niagara Falls, N.Y.

AUTOMATIC DOVETAIL GLUE JOINTER
Canadian Linderman Machine Company, Woodstock, Ont.

BABBIT METALS
Fay & Egan Co., J. A. Cincinnati, Ohio.

BALL BEARINGS
Chapman Double Ball Bearing Co., Toronto.

BALUSTER LATHES
Chicago Machinery Exchange, Chicago, Ill.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

BAND SAW FILING MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pryibil Machine Co., P., New York City.

BAND SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.

BAND SAW MACHINES
Berlin Machine Works, Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.

BAND SAW STRETCHERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

BENCHES
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

BENDING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

BELTING
Fay & Egan Co., J. A., Cincinnati, Ohio.

BLOWERS
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BLOW PIPING
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

BORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Pryibil Machine Co., P., New York.

BOX MAKERS' MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter, D., Winchendon, Mass.

BRUSHES
Meakins & Sons, Hamilton.

CABINET PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

CARS (Transfer)
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

CARBORUNDUM PAPER
Carborundum Co., Niagara Falls, N.Y.

CARVING MACHINES
Chicago Machinery Exchange, Chicago.
Curtis Machinery Corporation, Jamestown, N.Y.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CLAMPS
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
Palmer & Sons, A. E., Owosso, Mich.
Simonds Canada Saw Company, Montreal, P.Q.

COLUMN CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

COLUMN MACHINERY
Curtis Machine Corporation, Jamestown, N.Y.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

CUT-OFF SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Ober Mfg. Co., Chagrin Falls, Ohio.
Pryibil Machine Co., New York.
Simonds Canada Saw Co., Montreal, P.Q.

CUTTER HEADS
Berlin Machine Works, Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Galt, Ont.

DADO HEADS
Elliott, W. A., Toronto.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

DOVETAILING MACHINES
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.

DOWEL MACHINES
Chicago Machinery Exchange, Chicago.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.

DRY KILNS
Andrews Co., A. H., Chicago, Ill.
Grand Rapids Veneer Works, Grand Rapids, Mich.
Morton Dry Kiln Co., Chicago, Ill.
Sheldons, Limited, Galt, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

DUST SEPARATORS
Invincible Blow Pipe Company, Toronto.
Sheldons, Limited, Galt, Ont.

EDGERS (Single Saw)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

EDGERS (Gang)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P.Q.
Williams Machinery Co., A. R., Toronto, Ont.

END MATCHING MACHINE
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

EXHAUST FANS
Invincible Blow Pipe Company, Toronto.
Sheldons Limited, Galt, Ont.

FILES
Simonds Canada Saw Co., Montreal, P.Q.

FLOORING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Son, Baxter D., Winchendon, Mass.

FILLERS
German-American Stain Co., Grand Rapids.
Marietta Paint & Color Co., Marietta, Ohio.
Schmidt Co., Walter K., Grand Rapids, Mich.

FLUTING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

FLUTING AND TWIST MACHINE
Pryibil Machine Co., P., New York City.

GARNET PAPER AND CLOTH
The Carborundum Co., Niagara Falls, N.Y.

GRAINING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

GLUE
Perkins Glue Company, South Bend, Ind.

GLUE CLAMPS
Black Bros. Machinery Co., Mendota, Ill.
Palmer & Sons, E., Owosso, Mich.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.

GLUE SPREADERS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

GLUE ROOM EQUIPMENT
Perrin & Co., W. R., Toronto, Ont.

GLUING CAMP CARRIERS
Billstrom, Nels. J., Rockford, Ill.

GRINDERS (Cutter)
Fay & Egan Co., J. A., Cincinnati, Ohio.

GRINDERS, HAND AND FOOT POWER
The Carborundum Co., Niagara Falls, N.Y.

GRINDERS (Knife)
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.

GRINDERS (Tool)
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

GRINDING WHEELS
The Carborundum Co., Niagara Falls, N.Y.

GROOVING HEADS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.

GUARDS (Saw)
Pyribil Machine Co., P., New York.

GUMMERS, ETC.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HAND PROTECTORS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HARDWARE SPECIALTIES
Reflector & Hardware Mfg. Co., Chicago, Ill.

HAND SCREWS
Black Bros. Machinery Co., Mendota, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

HANDLE & SPOKE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

HARDWOOD LUMBER
Archer Lumber Co., Helena, Ark.
Atlantic Lumber Co., Toronto.
Duhlmeier Bros., Cincinnati, Ohio.
Imperial Lumber Co., Columbus, Ohia.
Kosse, Shoe & Schleyer, Cincinnati, Ohio.
Kraetzer-Cured Lumber Co., Moorhead, Miss.
Mowbray & Robinson, Cincinnati.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Powell Myers Lumber Co., South Bend, Ind.
Prendergast Co., Cincinnati, Ohio.
Shiels & Co., Chas. F., Cincinnati, Ohio.
Spencer, C. A., Montreal.
Wilcox & Knapp, Conneautville, Pa.

HUB MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

HYDRAULIC VENEER PRESSES
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Company, Wm. R., Toronto, Ont.

JOINTERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.

KNIVES (Planer and others)
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Galt Knife Co., Galt, Ont.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.

LATHES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

MACHINE KNIVES
Berlin Machine Works, Ltd., Hamilton, Ont.
Simonds Canada Saw Co., Montreal, P.Q.

MITRE MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.

MITRE CLAMPS
Black Bros. Machinery Co., Mendota, Ill.

MITRE SAWS
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Co., Montreal, P.Q.

MORTISING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

PAINTS & VARNISHES
Marietta Paint & Color Co., Marietta, Ohio.

PATENT SOLICITORS
Dennison, H. J. S., Toronto, Ont.
Lightfoot, Stanley, Toronto, Ont.

PATTERN SHOP MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.

PICTURE FRAME MACHINERY
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.

PLANERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pyribii Machine Co., P., New York.
Whitney & Son, Baxter D., Winchendon, Mass.

PLANING MILL MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Pryibil Machine Co., P., New York City.
Shimer & Sons, Samuel J., Milton, Pa.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

PRESSES (Veneer)
Black Bros. Machinery Co., Mendota, Ill.
Perrin & Co., Wm. R., Toronto, Ont.

PULLEYS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

RESAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Simonds Canada Saw Co., Montreal, P. Q.
Williams Machinery Co., A. R., Toronto, Ont.

RIM AND FELLOE MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

RIP SAWING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

RUBBING MACHINES
Curtis Machine Corporation, Jamestown, N.Y.

SANDERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Curtis Machine Corporation, Jamestown, N.Y.
Duplex Moulding Sander Co., Hornell, N.Y.
Elliot Woodworker Company, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.

SANDPAPER
Black Bros. Machinery Co., Mendota, Ill.

SASH, DOOR & BLIND MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Black Bros. Machinery Co., Mendota, Ill.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Shimer & Sons, Samuel J., Milton, Pa.

SAWS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SAW GUARDS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Pyribil Machine Co., P., New York.

SAW GUMMERS, ALOXITE
The Carboroundum Co., Niagara Falls, N.Y.

SAW SWAGES
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Simonds Canada Saw Co., Montreal, Que.

SAW TABLES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.

SAW JOINTERS
Huther Bros. Saw Mfg. Co., Rochester, N.Y.

SCRAPING MACHINES
Chicago Machinery Exchange, Chicago, Ill.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCROLL SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pyribil Machine Co., P., New York.
Simonds Canada Saw Co., Montreal, P.Q.

SECOND-HAND MACHINERY
Chicago Machinery Exchange, Chicago, Ill.
Pyribil Machine Co., P., New York.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chargrin Falls, Ohio.
Petrie, H. W., Toronto.
Pyribil Machine Co., P., New York.
Shimer & Sons, Samuel J., Milton, Pa.
Simonds Canada Saw Co., Montreal, P.Q.
Whitney & Sons, Baxter D., Winchendon, Mass.

SHARPENING TOOLS
The Carborundum Co., Niagara Falls, N.Y.

SHAVING COLLECTORS
Invincible Blow Pipe Co., Toronto.
Sheldons Limited, Galt, Ont.

SINGLE SPINDLE BOXING MACHINES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.

SPRAYING APPARATUS
De Vilbiss Mfg. Co., Toledo, Ohio.

STAINS
Marietta Paint & Color Co., Marietta, Ohio.

STAVE SAWING MACHINE
Whitney & Sons, Baxter D., Winchendon, Mass.

STEAM TRAPS
Canadian Morehead Mfg. Co., Woodstock, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

STORE FIXTURES & FITTINGS
Reflector & Hardware Specialty Mfg. Company, Chicago, Ill.

SURFACERS
Berlin Machine Works, Ltd. Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Petrie, H. W., Toronto.
Whitney & Sons, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

SWING SAWS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Simonds Canada Saw Co., Montreal, P.Q.

TABLE LEG LATHES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

TENONING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Pryibil Machine Co., P., New York City.

TRIMMERS
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

TRUCKS
Chicago Machinery Exchange, Chicago, Ill.
Standard Dry Kiln Co., Indianapolis, Ind.
Sheldons Limited, Galt, Ont.

TURNING MACHINES
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Pryibil Machine Co., P., New York City.
Whitney & Sons, Baxter D., Winchendon, Mass.

UNDER-CUT SELF-FEEDING FACE PLANER
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.

UNIVERSAL WOODWORKING PLANER
Chicago Machinery Exchange, Chicago, Ill.
Elliot, W. A., Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

VARNISH SPRAYER
De Vilbiss Mfg. Co., Toledo, Ohio.

VARNISHES
Ault & Wiborg Company, Toronto.
Marietta Paint & Color Co., Marietta, Ohio.

VENEERS
Central Veneer Co., Huntington, W. Virginia.
Cincinnati Veneer Company, Cincinnati, Ohio.
Clark Veneer Co., Walter, Grand Rapids, Mich.
Dupre & Company, C., Toronto.
Goshen Veneer Company, Goshen, Ind.
Haughton Veneer Company, Chicago, Ill.
Hoffman Bros. Company, Fort Wayne, Ind.
Huddleston-Marsh Lumber Co., Chicago, Ill.

VENEERS (contd.)
Ohio Veneer Company, Cincinnati, Ohio.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Strong Veneer Company, Jamestown, N.Y.
Wisconsin Seating Co., New London, Wisconsin.

VENTILATING APPARATUS
Sheldons Limited, Galt, Ont.

VENEER PRESSES (Hand and Power)
Black Bros. Machinery Co., Mendota, Ill.
Canadian Boomer-Boschart Co., Montreal, Que.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Huther Bros. Saw Mfg. Co., Rochester, N.Y.
Simonds Canada Saw Company, Montreal, P.Q

WAGON AND CARRIAGE MACHINERY
Berlin Machine Works, Ltd., Hamilton, Ont.
Chicago Machinery Exchange, Chicago, Ill.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Company, Chagrin Falls, Ohio.
Whitney & Sons, Baxter D., Winchendon, Mass.

WOOD FINISHES
Marietta Paint & Color Co., Marietta, Ohio.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WHEELS, Grinding, Carborundum and Aloxite
The Carborundum Co., Niagara Falls, N.Y.

WOOD SCREWS
Robertson & Company, P. L., Milton, Ont.

WOODWORKING CUTTERS
Galt Knife Company, Galt, Ont.

YELLOW PINE
Prendergast Co., Cincinnati, Ohio.

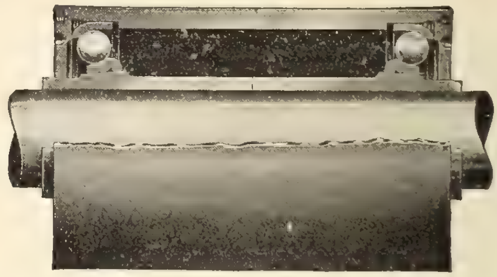
The Glue Book

What It Contains:

Chapter 1—Historical Notes
Chapter 2—Manufacture of Glue
Chapter 3—Testing and Grading
Chapter 4—Methods in the Glue Room
Chapter 5—Glue Room Equipment
Chapter 6—Selection of Glue

Price 50 Cents

Woodworker Publishing Co.
Limited
MacLean Building, Toronto



Your Loose Pulley Trouble Disappears

when installed with

CHAPMAN BALL BEARING LOOSE PULLEYS

A little vaseline once a year is all the attention and lubrication required.

Our loose Pulleys cannot run hot and do not cut the shaft.

Write us for particulars and price list.

The
Chapman Double Ball Bearing Co.
of Canada, Limited
339-351 Sorauren Ave., Toronto, Canada

1913 Edition

"Practical Pattern Making"

A Practical Work on

The Art of Making Patterns, written by a pattern-maker with thirty years' experience. Contains information on Pattern Making and Pattern-Makers in general, also a detailed description of the necessary materials and how to use them. Then the tools, both hand tools and machine tools, with special chapters on the Lathes, the Band Saw and the Circular Saw, with many examples of work which may be done on these machines.

A complete section of illustrated examples of Pattern-Work in wood, with many pages of metal pattern-work, Gating and Plate work. Both Vibrator and Stripping Plates are shown. Specific instructions for plaster work are given, and finally, the cost, marking and record of patterns are explained and illustrated.

By F. W. BARROWS

Price $2.00

CANADIAN WOODWORKER
345 Adelaide St. West, TORONTO

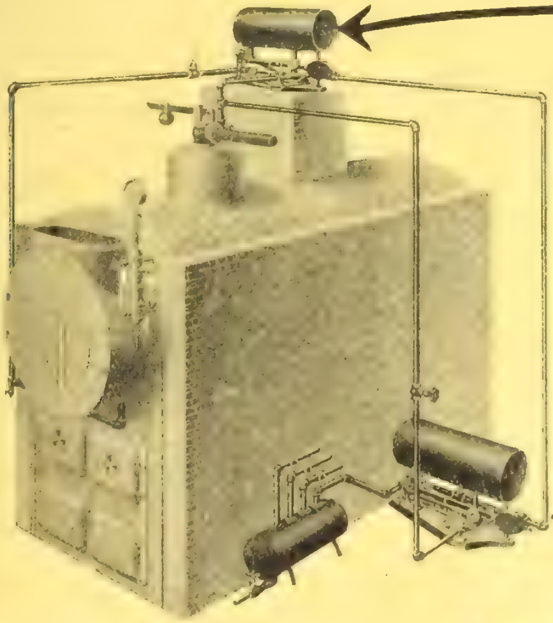
Why Struggle Along

with an old nuisance of a drying system that's perpetually balking — kicking back — laying down—spoiling a scandalous percentage of your product.

The Standard Drying System

is so adaptable—the drying conditions so completely under control—the apparatus and construction of so high a quality—that the drying is done just right, without fuss or bother, no matter what the variety of the stock.

Write for the catalog and new List of Users. Address: The Standard Dry Kiln Company, 1560 McCarty Street, Indianapolis, Ind.



Compliments of the Season

205 deg. Fahr. is about the highest temperature at which the ordinary feed pump will handle water. The Morehead System drains the steam apparatus of all condensation and feeds it direct to the boilers at 100 to 150 degrees higher than the steam pump can, and on 90 per cent. less steam.

Morehead
Back to Boiler
SYSTEM

That's why such mammoth concerns as the Washburn Crosby Co., the Packard Motor Car Co., Yawman & Erbe, Sankey Bros., etc., have installed the Morehead System in their plants. It saves them many dollars every day besides doing away with [illegible] and repairs.

Made in Canada

If you would like to install a better method of handling condensation investigate the Morehead System. Don't delay this chance to save. Write us today.

Made in Canada

Canadian Morehead Mfg. Company, Woodstock, Ontario

PLANT THE THOUGHT OF QUALITY EARLY

Finish your furniture so that even the school-children will admire it and remember till they grow up how beautiful it looked and how long it lasted.

Yet a few years and they'll be in the market for furniture themselves. Watch them hunt up that same dealer and ask for that same make of furniture.

The very policy we're recommending to you is the policy we pursue in making

Marietta
Spartan Art Wood Stains

We are working for your future business.

Write for sample of our 1914 Principle
NON-FADING MAHOGANY STAIN.

The Marietta Paint & Color Co.,
Marietta, Ohio.